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Rubber in Bantam Golf

Miniature Courses Seek Resilient Waterproof Coverings for Greens and Fairways—Rubber Putting Tees That Aid Beginners—Solid Balls in Large Demand

OPERATORS of miniature golf courses, who, according to the United States Department of Commerce, have shown their faith in the future of this new form of amusement by investing upwards of $125,000,000 in it already, are looking more than ever to rubber manufacturers to help them in getting not only much essential material but also novelties that may increase and retain patronage.

Satisfactory covering for greens and fairways gives operators most concern. Their choice in the looser types ranges from an imitation of turf made by rolling cottonseed hulls with either oil or green paint to a top dressing of tinted and oiled ground cork. The firmer types include goats' hair woven in burlap, pressed feathers in a gum binder, plain and waterproofed green and undyed felt, and hemp, bristles, cotton, and other fabrics embedded in solid rubber alone or backed with sponge rubber and burlap. Factors affecting the choice of such material are mainly price, looks, durability, moisture-resistance, and suitability for the playing of the game.

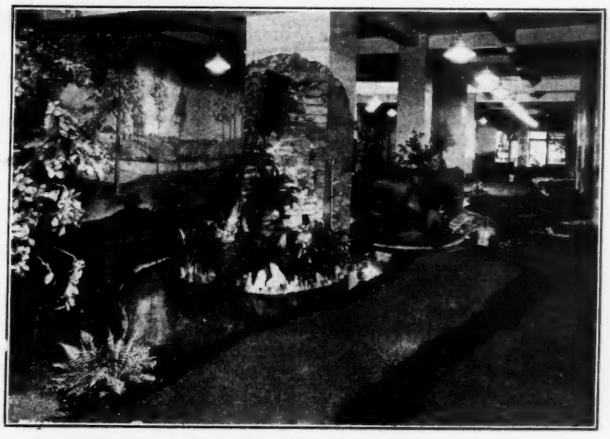
Testing Rubber Covering

Most operators seek a covering that has a surface simulating mowed grass but which does not offer so much resistance as to make a "slow" ball nor have a surface so solidly matted and level as to give a "fast" ball. Rubber manufacturers are confident that they can produce a product that can strike a happy medium, and tests thus far given certain rubberized materials seem to justify their claims. Yet they do not hold that the last word has been said on the subject. Evidently impressed with the large potential demand, some of the largest rubber manufacturers in the country are said to be conducting extensive experiments along this line, the results of which may not be made known for many months.

One rubber carpet which is being developed to give a moderate speed to a ball has a Wilton pile with a backing of sheeted rubber forced into it while the latter is being vulcanized. The material is claimed to be exceptionally tough, is non-permeable to water, and may easily be washed with a hose and as readily dried.

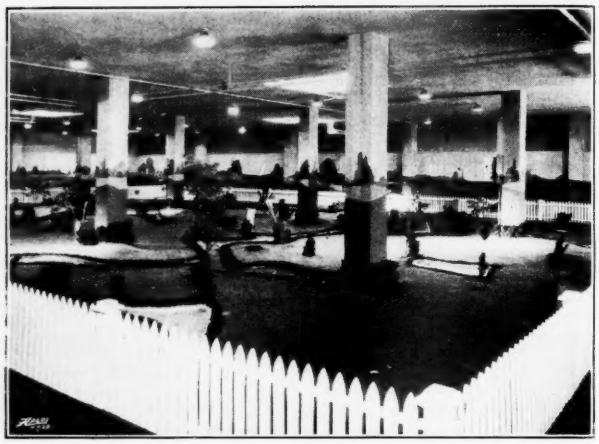
Plain sheeted rubber matting of standard type with the surface slightly ribbed so that the ball may not run too true is in use in many places and has the evident advantages of low cost, durability, and of being easily fitted and cleaned.

A variation of the latter, on which experiments are being made, is rubber matting to which is cemented heavy burlap with a water-resistant adhesive. It is claimed that not only is such a covering comfortable underfoot, but that the burlap affords just enough resistance to the ball to make playing pleasant, and if damaged the burlap may easily be torn off and cheaply replaced.



Miniature Golf Course—41 E. 42nd St., New York, N. Y.

Tom Thumb Course, Riverside Drive, New York, N. Y.



American Golfer Course, Grand Central Palace, New York

A new type of rubber carpet about to be marketed is made of regenerated rubber obtained from old tires and still containing all their cotton fabric. While the rubber affords advantages that are uniquely its own, the cotton fibers on the surface are said to make the top just rough enough to insure reasonable ball speed.

A rubber turf quite widely used on the little links has a tough, closely-woven jute backing, a secondary base of ¼-inch sponge rubber to provide a desired resilience, and a top coat of green-painted sisal fiber crushed to resemble bent grass. Like the reclaimed rubber covering, its cost of upkeep is said to be but nominal. It is made up in 9 and 11 feet lengths, 3 feet wide. A variation of this type is a rubber carpet with a sponge rubber underlay, which has found favor especially for indoor courses.

To get a more or less resilient effect, as well as to waterproof the covering, some course operators have been experimenting with a benzene-rubber solution sprayed on felt. Apart from a partial matting of the felt on the evaporation of the solvent, the general result is said to be quite satisfactory, and much less objectionable than the spraying of felt with paraffin dissolved in gasoline, which some have been using for proofing coverings.

An eastern concern has developed some specially treated rubber fabrics for use on indoor miniature golf courses. Of these, two grades are available of distinctly different types. One has a surface of sponge rubber and the other is impregnated. In both instances the body of the material consists of jute filling faced with burlap. In one type this base is surfaced each side with a rubberized green coating and finished on the top with a very thin layer of green sponge rubber.

In the other type the jute base is impregnated on both sides with green rubber cement.

It is claimed that this type of material has the advantage of presenting a very smooth putting surface that requires practically no maintenance. It can be cemented easily to a solid surface by use of suitable cement and will conform to the contour of the layout. It will not readily scuff and due to the base material has a soft cushioning effect that is so desirable in fairways and putting greens of miniature golf courses.

From the Pacific Coast comes another surfacing for indoor golf courses. It is the patented material known as "Rubber Turf." This product is made by devulcanizing vulcanized rubber scrap by a patented process which yields so-called liquid rubber, which is fabricated with certain dry and elastic fillers into waterproof sheets. These form a near approach to closely cut natural turf that is not affected by rain or snow, and they can be replaced easily when worn.

After a rainstorm it requires only rolling to squeeze out any undrained water. The sheets can be easily laid upon an under surface of any material and, it is said, will last three times as long as felt; while exposure to the sun only makes it tougher.

Variety of Balls

Balls, of course, form an important part of course equipment, some operators carrying in stock as many as 20,000, long-drive high-netted courses providing them by the bucketful for players. While balls for regular golf are now well standardized, the types used on most courses show many variations in make and quality. Some of the new solid rubber balls are smartly painted, quite durable, and sell as low as 10 cents at retail. Other solid ones have a hard finish that gives them a fair "click," can give good distance, and the rubber is colored throughout. They are of the new size and can be used on the regulation courses. One solid ball with a gutta percha cover sells for a quarter, and may be branded at a small extra charge.

One rubber manufacturer turns out 5,000, 10-cent solid rubber balls a day. The balls are made in multi-molds and subjected while vulcanizing to 140 tons' pressure. Owing to the low cost of crude rubber, no reclaim is used, and the compounding is so devised that each ball has the same specific gravity as a high grade regular ball. The balls are sprayed with colored rubber lacquer softened with castor oil.

A special elastic ball is used in a patented golf game in which it is made to carom in billiard fashion through a maze of lanes on a course. In a new indoor billiard table form of golf a standard ball is used for caroming in an 18-hole game.

Rubber Specialties Increase

In the steadily increasing list of rubber specialties for courses is an ingenious putting tee, a green pad 15 by 18 inches, and made of 90 per cent new rubber. On the left edge are a row of 15 slight depressions painted red and into any of which a ball may be set, while to the right of the cavities is a slightly indented line on which a putter may be set and trued up for the amateur.

Another novelty is a rubber vacuum cup attachable to the top of a putter, which enables a player to retrieve a ball from the ground without having to stoop.

In one popular line of golf clubs the shaft is of hickory with the handle encased in a molded serrated rubber grip, giving a secure grip for the player and adding to the attractive finish of the club.

Rubber Window Channels

A Survey of the United States Patents Relating to the Manufacture of Window Channels

Joseph Rossman, Ph. D.

THE use of rubber for preventing the rattling and the breaking of glass windows had been suggested many years ago. In 1868 J. Liness was granted U. S. patent No. 75,556 for removable strips provided with rubber linings to be used in railway cars, stage coaches, and steamboats. At that time there were no high-powered automobiles and no speed laws so that the rattle of glass windows in moving vehicles was not very noticeable or annoying. Very few improvements were, therefore, made in rubber window channels until comparatively recent years.

The First Rubber Channel

The first rubber channel which resembles the one in use today is described in patent No. 131,662 issued in 1872 to Carpenter. It merely consists of a strip of rubber bent into U-shape, which is placed in the groove of a window to receive the edge of a window pane. To retain the channel in place various expedients were used such as providing the rubber strip with projections which fitted into the grooves of the window channel, as in patent No. 163,016 dated May 11, 1875.

Providing Gripping Means

In order to insure a good grip on the glass, Tanner describes in his patent No. 252,707, Jan. 24, 1882, a rubber channel having inwardly inclined legs. This simple and efficient expedient has been used ever since. A later patent No. 377,474 went still further by simply using a longitudinally slit rubber tube as a channel.

Elimination of Sticking

It was soon found that when the glass fitted very snugly in the rubber channel, it was often very difficult to move the glass on account of friction. A solution for this difficulty is mentioned in patent No. 516,245, Mar. 13, 1894, to Tinker, where the rubber channel is covered with tinfoil or paper to provide a non-friction surface for the glass.

The next development was a U-shaped rubber channel completely covered with canvas as described in patent No. 977,415, Nov. 29, 1910, to Mathews. This channel embodies all the advantages found in the prior channels. It provides a cushioning and a yielding as well as a gripping surface for the glass, and the canvas prevents the glass from sticking to the rubber.

For the next ten years changes in rubber channel apparently stood at a standstill as no patents were granted during this period. Since 1920, however, as shown by the large number of patents issued for channels, a very great deal of effort has been expended in improving the channel itself as well as in expediting the methods of manufacture.

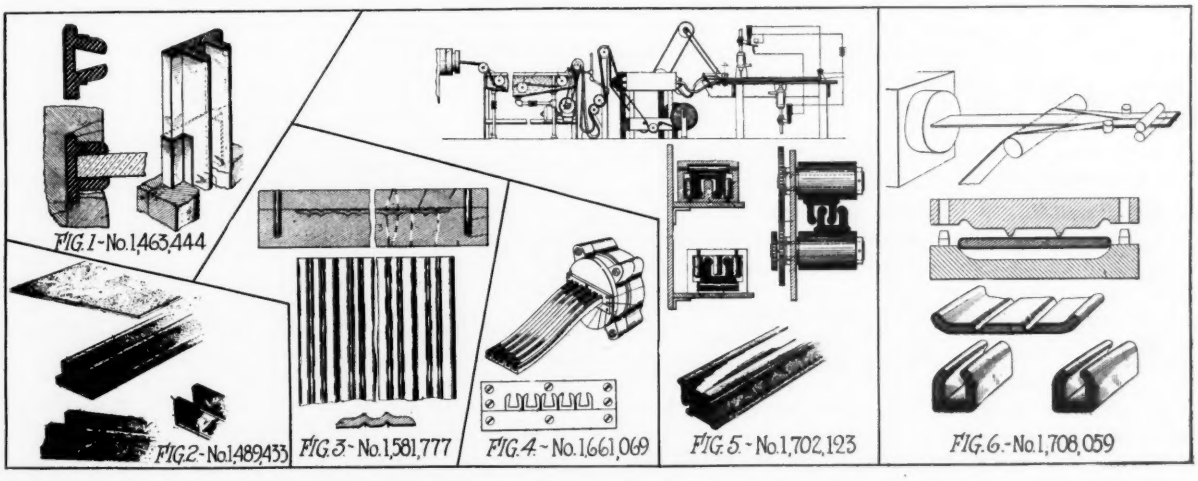
The Modern Channel

The Simpson patent No. 1,463,444, July 31, 1923, describes the type of rubber channel which is in general use today on all automobiles. This is of soft rubber covered with velveteen or plush. It can be inserted readily into the window well after the final finishing coat has been applied to the body of the car. The channel has flat flanges which serve to anchor it in the window molding. (See Figure 1.)

The Gammeter Method

John R. Gammeter was the first inventor to obtain a patent for a new method of making a channel. In his patent No. 1,489,433, Apr. 8, 1924, shown in Figure 2, he describes his method as follows:

"A relatively-thick coating of vulcanized rubber is applied to one side of a wide sheet of fabric such as felt or velvet, which is then cut into a plurality of relatively narrow strips, each strip being wide enough for one of the channels and of the same length as the original sheet. In similar manner narrow reenforcement strips are prepared, preferably of heavy square-woven fabric friction coated on both sides.



"Then the fabric strip is folded or doubled upon itself, with the rubber coating inside, to form the spaced-apart legs, and intermediate base portion of the channel. Then the reenforcing strip is fed into adhesive engagement with the bottom of the base portion, after which the edges of the strip are folded around it preferably meeting in a butt seam along the base portion.

"The channels are provided with laterally-projecting flanges forming extensions of their base portion, this type of channel being adapted to be fitted in a grooved metal frame strip. In some cases these flanges are dispensed with, wherein the lateral margins of the strip terminate flush with the base of the channel.

"During the time the strip is being folded to form the channel its rubber coating is rendered tacky by the application of rubber cement, and the strip may be similarly treated if desired. The plies of the channel are pressed firmly into adhesive engagement when folded, and then vulcanized in open, dry heat, either in long lengths or in lengths suitable for the windows with which they are to be used."

Continuous Production of Channels

On Oct. 6, 1925, Ambler and Rohrbacher obtained patent No. 1,555,816 for continuously covering a strip of vulcanized rubber channel with fabric. It was old, of course, to apply covers longitudinally to strip material such as tire bead strips, but such devices were not adapted to cover longitudinally channeled strip material or vulcanized rubber strip material generally. It is difficult to apply a layer of fabric to the interior of a rubber channel as the fabric is likely to wrinkle and draw a part of the rubber with it, giving an unsatisfactory product.

Ambler's machine employs a series of rollers which spread the legs of the channel strips, and the cover is applied first along the middle part of the channel's floor and then in successive steps laterally about the rest of the strip.

Vulcanizing the Rubber to a Fabric

According to patent No. 1,581,777, to Beynon, and shown in Figure 3, a fabric lined rubber channel is made as follows: "A sheet of unvulcanized rubber and a sheet of fabric are placed between a pair of molds, the upper being provided with a series of longitudinal ridges adapted to form lines of fold in the completed strips. The lower mold is recessed to receive the rubber except for ridges spaced apart the width of the strip desired. Further grooves are formed in the recessed portion opposite the ridges. Sufficient heat and pressure are applied to vulcanize partially the rubber, and the sheet is removed.

"The sheet is then run over the knives to separate the sheets into strips along the lines formed by the ridges. The separated strips have grooves on the fabric side and ridges on the opposite side registering with the grooves. The strips are then bent or folded along the lines of the grooves to form a channel. It will be evident that the ridges serve to fill out the outer corners of the channel to be formed with sharp corners."

After bending the strip into channel form it is placed in molds and vulcanized.

Extruding a Plurality of Channels

Hartung in patent No. 1,661,069, Feb. 28, 1929, employs an extruding machine for making rubber channels. (See Figure 4.) A plurality of strips is extruded so that they come progressively into contact as the rubber swells upon emerging from the die. This method is well adapted for the simultaneous formation of a large number of strips. The strips adhere together sufficiently to support each other against distortion during the vulcanizing operation and yet may be separated readily after they are vulcanized.

When the strips emerge in the relative positions shown, the contact and adhesion of adjacent strips is such that their adjacent legs are supported by the adhesion of their outer faces to each other. As the combined structure emerges from the extruding machine, it is cut into suitable lengths and vulcanized; after this the strips are pulled apart.

Multiple Production of Channels

Channel rubber has been commonly produced by extruding a continuous strip of channel section from a tubing machine, coiling the strip upon a pan, then vulcanizing the strip, and thereafter cementing it and covering it with a cemented strip of fabric or felt, the strip of rubber being handled singly, both before and after the covering operation.

The object of patent No. 1,702,123, Feb. 12, 1929, to Matthias is to reduce waste and production cost. (See Figure 5.) This is attained by extruding two strips of the channel at adjacent positions, cooling the strips in water to shrink them and reduce their plasticity, feeding them through covering machines, and bringing them together with one leg of each strip extending into the channel of the other so that the strips sustain each other, measuring and cutting to length the two strips while they are thus associated, and then vulcanizing the cut lengths of strips in open heat.

The apparatus comprises an extruding machine having a die to extrude side by side two strips of the channel rubber. From the water bath the strips are each led through an air-blast ring adapted to blow the water from all sides of the strip and then over a driven feed roll into a reserve loop. Each strip is guided out of the reserve loop in an inverted position so that any water in the channel will be spilled out. The strips are then led past air nozzles, which remove any water remaining in the channels, and over guide rollers to the covering machines, which may be of the type shown in Ambler and Rohrbacher patent No. 1,555,816, each of the machines being adapted to apply to its rubber strip a covering strip of fabric or felt, the covering strips being drawn from stock rolls. The covering strips are cemented on the face which is to contact the rubber of the channel strip.

From the covering machines the two strips are brought into contact with each other and measured off into lengths to be cut by a pneumatic guillotine cutter. As each length is severed, it is removed by an operator and packed with others in a vulcanizing pan. The lengths are then vulcanized in dry heat, the covering material preventing adhesion of the strips with each other and also contributing to the preservation of the cross-sectional form of the strips during vulcanization.

Flat Window Channels

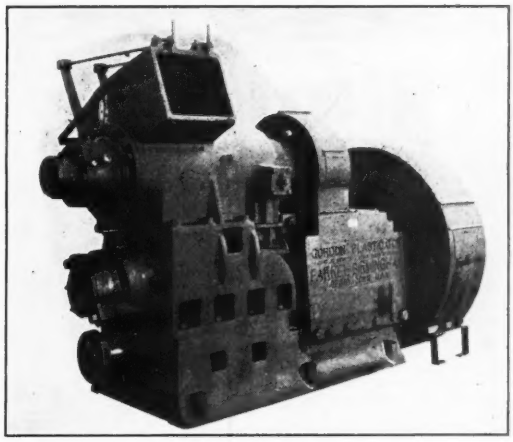
A recent patent No. 1,708,059, Apr. 9, 1929, to Griffiths, makes channels in flat form readily handled for shipment. (See Figure 6.) A flat strip of rubber is extruded from a die, and a strip of fabric is wrapped about the strip as it emerges. The assembled strips pass over a guide roller to folding means consisting of rollers journaled to rotate about vertical axes, and rollers journaled to rotate about horizontal parallel axes. The rollers fold the margins of the fabric about the rubber strip or body and press it against the strip with sufficient force to cause it to adhere thereto.

The covered strip thus produced is cut into suitable lengths and is then ready for shaping and vulcanizing in a two-part mold, the upper section having a pair of parallel wedge shaped ribs, which, when the mold is closed, form two parallel channels in the covered strip. The ribs are of such height that practically all the rubber is displaced at the fold lines, and the upper and the lower fabric layers are pressed together at the bottom of the channels forming flexible fabric hinges. When the article is to be applied to the window, the marginal portions are folded up perpendicular to the base, for placing in the door frame of the car.

(*To be continued.*)

Efficiency of Gordon Plasticators

Survey Made by A. C. Nielsen Co., Engineers, in Collaboration with and Approved by Prominent Manufacturer of Tires



The Gordon Plasticator

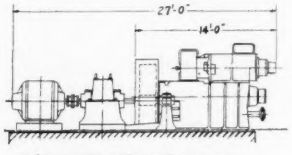
IT IS generally accepted that substantial advantages are gained by progressive manufacturers engaged in a mass production industry when they promptly replace equipment that becomes obsolete through the development of better method machines. The benefits are even greater when the newer equipment, designed with special attention to the needs of a specific job, replaces machines originally intended to give a wide range of possible uses without specialization on any one. This survey deals with two-stage plasticators, showing how one battery of two 20-inch units is doing work which formerly required twelve 84-inch roll mills. The cost reduction is in excess of 40 per cent, and the net annual saving by two machines is more than $61,000.

Plasticator Operation

The two two-stage plasticators referred to are of 20-inch size with 20- by 24-inch feed hoppers. Each has a 500 hp. motor, roller bearings throughout, and steel gearing running in oil. The upper worm turns at 19 and the lower at 17 r.p.m., and the normal working temperature is about 265° F. Both machines work continuously on a 24-hour schedule for six days a week, or approximately 300 days each year.

Smoked sheet and sprayed latex rubber is delivered for breaking down in 35 pound pieces, by a conveyer serving both machines. One man attends the two feed hoppers, and two others remove the finished stock in 7-inch solid cylinders, which are cut automatically to 30-inch lengths. A fourth man is permanently assigned to this equipment to clean up around it and remove the tailings. The machines also bear a half-time charge for one man who acts in a supervisory capacity.

The plasticity of stock entering the machine is designated locally as K-7.1. A single pass through either machine results in plasticity K-5.5, and a second pass delivers material testing K-4.9. A conveyer facilitates the return of single pass materials to the feed hoppers, and special racks built to fit lift trucks are used for delivering finished stock to the mixers.



20" Gordon Two Stage Plasticator

The total 24-hour output per machine is about 102,500 pounds, 60 per cent, or 61,500 pounds being double passed to plasticity K-4.9 and the remainder going on to the mixers after one pass, at plasticity K-5.5. First pass material is put through at the rate of 6,500 pounds per hour, and the second pass is made at about 7,580 pounds. The average net hourly output of double passed material at plasticity K-4.9 is 3,500 pounds per machine.

Former Equipment

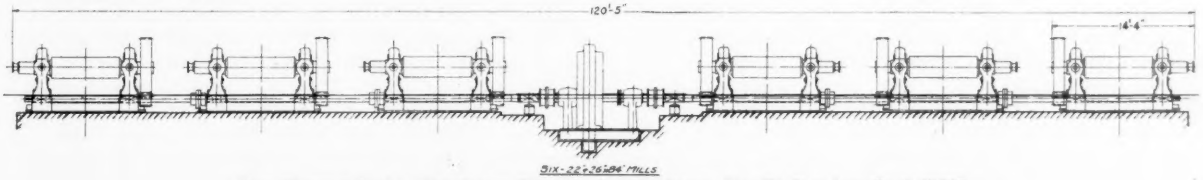
Break-down work equivalent in volume to that now done with two plasticators formerly required the full time operation of twelve 84-inch roll mills, or more exactly, 11.8 but equivalent to 12 for all practical purposes. Seven day operation was sometimes necessary to maintain satisfactory production schedules elsewhere. As floor space was at a premium and the mills had been forced to the limit of their capacities, there was no practical alternative but to seek equipment capable of higher output per unit of space occupied.

The 84-inch mills handled the rubber in 300-pound batches, running 17 minutes to produce material of plasticity K-5.5 and 30 minutes to reach plasticity K-4.9. Hourly output per mill on this basis was 1,050 and 600 pounds, respectively. Total floor space for actual output was 2¼ times that now required, and power, based on the records of graphic meters, was about 8 per cent more. The largest item of additional cost, however, was labor. There were twelve machine operators, one general clean-up man and one full-time supervisor, a total of 14 men in contrast with 4½ on two plasticators. Considering the actual hourly rates, labor cost with mills was 3.15 times the present total.

Some of the original roll mills are still operating on a part-time basis, and others are entirely useless. The owners have elected to dismantle the mills and stock their parts against possible later need for replacement purposes instead of attempting to dispose of this old equipment in the used machine market.

Comparative Plasticating Costs

Table 1 summarizes the basic operating data mentioned above. Table 2 shows a detailed calculation of plasticating



One Twenty-Inch, Two-Stage Plasticator Replaces Six Eighty-four-Inch Mills

TABLE 1

GENERAL DATA ON PLASTICATION OF SMOKED SHEET AND SPRAYED LATEX

	84-Inch Roll Mills	20-Inch Plasticators
Number of machines for equal output	12	2
Floor Space Requirements		
Per machine	240 sq. ft.	640 sq. ft.
Total for all	2,880 sq. ft.	1,280 sq. ft.
Operating Schedule		
Hours per day	24	24
Days per year	300	300
Plasticity		
As fed from bales	K-7.1	K-7.1
After 17 min. in mill	K-5.5	
After 30 min. in mill	K-4.9	
After 1st pass		K-5.5
After 2nd pass		K-4.9
Production Rates. Pounds per Hour		
Per machine		
K-7.1 to K-5.5 (17 min. or 1 pass)	1,050 lb.	6,500 lb.*
K-7.1 to K-4.9 (30 min. or 2 pass)	600 lb.	3,500 lb.*
Approximate Division of Output		
K-5.5 (40%) pounds per day	82,000	82,000
K-4.9 (60%) pounds per day	123,000	123,000
Totals	205,000 lb.	205,000 lb.
Division of Time per Machine		
K-5.5: 82,000 ÷ (1,050 × 12) and (6,500 × 2)	6.51 hr.	6.31 hr.
K-4.9: 123,000 ÷ (600 × 12) and (3,500 × 2)	17.08	17.57
Total running time per day	23.59 hr.	23.88 hr.
Power		
Hourly rates		
Former average	85.0 hp.	
Present		
1st pass		487.5 hp.
2nd pass		425.0 hp.
Daily Totals		
Former, 85.0 × .746 × 12 × 23.59	17,950 kw.-hr.	
Present,		
1st pass, 487.5 × .746 × 2 × 15.77		11,470 kw.-hr.
2nd pass, 425.0 × .746 × 2 × 8.11		5,143 kw.-hr.
Labor		
Operators @ $.72 per hour	12	3
Inspector and supervisor @ $.85	1	½
Clean-up and tailings man @ $.65	....	1
Material handling to mills @ $.72	1	....

*Worm speeds 19 and 17 r.p.m.; temperature 265° F.

TABLE 2

COMPARATIVE PLASTICATING COSTS

Investment Data	Roll Mills	Plasticators
Initial cost per machine	$10,000.00	$23,000.00
Installation charges	2,000.00	12,000.00
Totals, per machine	$12,000.00	$35,000.00
Complete battery (12 and 2)	$144,000.00	$70,000.00
Annual Fixed Charges		
Depreciation (13-year basis)	$11,076.92	$5,384.62
Average interest @ 6%	4,652.31	2,261.54
Repairs and maintenance:		
Roll mills, allow $200.00 each	2,400.00	.....
Plasticators, 6% of first cost	.....	2,760.00
Floor space, 2,880 and 1,260 sq. ft. @ $.30	864.00	378.00
Totals, per year	$18,993.23	$10,784.16
Totals, per working hour	$2.685	$1.505
Hourly and Unit Plasticating Costs		
1-pass (17 min.) rubber, Plasticity K-5.5		
Hourly fixed charges from above	$2.685	$1.505
Power, 85.0 and 487.5 hp. (12 and 2 machines) @ $.01 per kw.-hr.	7.609	7.274
Labor, per Table 1	10.210	3.235
Totals, per hour	$20.504	$12.014
Totals, per cwt. finished rubber @ K-5.5	$.163	$.092
2-pass. (30 min.) rubber, Plasticity K-4.9		
Hourly fixed charges from above	$2.685	$1.505
Power		
Former average, as above	7.609	.....
Present, 458.7 hp. (weighted average) × .746 × 2 @ $.01	.....	6.844
Labor, as above	10.210	3.235
Totals, per hour	$20.504	$11.584
Totals, per cwt. finished rubber @ K-4.9	$.285	$.166
Savings Effected		
1-pass rubber, per cwt. ($.163-$.092) (43.6%)	$.071	.....
1-pass rubber, per day, $.071 × 820 cwt.	.....	$58.22
2-pass rubber, per cwt. ($.285-$.166) (41.7%)	$.119	.....
2-pass rubber, per day, $.119 × 1,230 cwt.	.....	146.37
Total savings, per day		$204.59
Total savings, per year, $204.59 × 300 days		$61,377.00
Net annual return on the investment of $70,000		87.7%

costs for both types of equipment. The first section deals with equipment and installation costs, and the second shows the annual fixed charges consisting of depreciation, average interest, floor space, and machine upkeep. The last of these items is necessarily estimated for the Gordon equipment because of its comparatively short period of service to date. The allowance has been made extremely liberal.

Table 2 also deals with the hourly and unit plasticating costs, considering the one pass and two pass products separately. Fixed charges, power and labor are set up for the complete assemblies of twelve and two machines, respectively. Unit costs are derived by dividing previously stated hourly outputs into the total hourly operating costs. On one pass rubber of plasticity of K-5.5 the cost per hundred pounds is $0.092 at present as compared with $0.163 formerly. Corresponding figures for two pass material of plasticity K-4.9 are $0.166 and $0.285.

Net Savings

The net saving per hundred pounds of one pass material is shown as $0.071, or 43.6 per cent. On two pass stock the saving is $0.119, and the cost reduction 41.7 per cent. Net daily savings total $58.22 and $146.37, respectively, and the total for both classes of material is $204.59 per day. On a 300-day schedule the net annual saving creditable to the two plasticators is $61,377. This is equivalent to a net return of 87.7 per cent per year on the total initial investment of $70,000.00.

Industry and Trade

AUTOMOBILE production declined in September to the extent of 1 per cent under August, the seasonal decline at this time of the year being also 1 per cent. Dealers stocks of new cars have reached a new low mark with the sixth consecutive decrease this year. Used car sales represented approximately two-thirds of all sales in August and have shown a tendency in recent months to be an increasingly larger fraction of total sales.

Gasoline consumption for the first eight months indicates an increase in domestic demand of 6.3 per cent over the period in 1929. Total consumption, including exports, gained by 7.4 per cent.

Crude rubber consumed in September declined 17.2 per cent under August consumption. The drop a year ago was 12 per cent. Rubber consumed during the month was 73 per cent of what it was a year ago. Imports increased and stocks on hand gained rapidly as a result.

Tires manufactured in August increased by 4 per cent, though they were fully 30 per cent under the output during the same month a year ago. Inventories were at their lowest levels since October 31, 1927.

Production of standard cotton cloths during September was greater than during August, but 32.1 per cent less than output for the same month a year ago. Stocks on hand at the end of the month showed a decrease of 11.4 per cent for the month, while unfilled orders increased 26 per cent.

As a result of continued low production of standard cotton cloths shipments were made out of stock and equalization of consumption with production came closer to realization.

The consumption of raw cotton in September showed an increase of 12 per cent over August, moving above the trend during the interval 1927 to 1929 for the two months in question. This increase is the first since April of this year.

Rubber Covered Rolls in the Textile Industry

THE iron, the steel, or the other hard metal rolls used on spinning machinery, drawing frames, and lap machines in textile mills are covered with a soft, resilient, yet firm, substance to prevent injury to the fine fibers and yarns during the drawing and twisting operations. The rolls are operated one above the other, the lower being fluted and the upper ones smooth metal, the latter pressing the textile material as it passes between the rolls in preparation for spinning or for the actual spinning process. Unless a soft covering on the rolls prevents the two metal surfaces from coming together, the quality of the product would be poor because of cut, chafed, and distorted fibers. Consequently the top rolls are covered with rubber, leather, cloth, or some composition to protect the ribbons of fibers. The bottom fluted rolls are not covered. Hence the process of roll covering for the textile mills is referred to as top roll covering, and the material which passes between the rolls as the sliver, the ribbon, the roving, or the yarn.

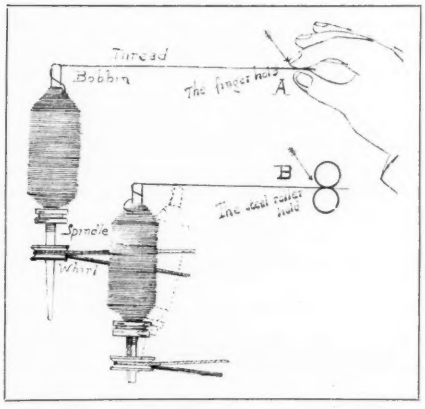


Fig. 1. Some Elements of the Pliable Finger Hold of Old-Fashioned Hand Spinning Wheels Are Obtained When the Thread Being Spun Is Gripped by Rubber Covered Top Rolls

We will take as an example the top drawing rolls of a spinning frame. In the mule system of spinning, a carriage containing a long row of revolving spindles backs off from the frame carrying the soft rovings with them, one roving to each spindle. If the spool end of a roving were held in the hand, as shown at *A* in Figure 1, the roving would be drawn and twisted as it spins over the top of the bobbin on the revolving spindle and become a thread.

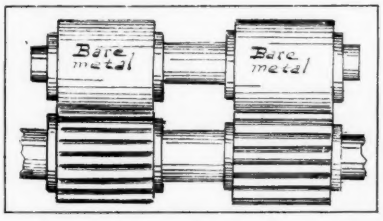


Fig. 2. Uncovered Top Rolls of a Spinning Frame

From 500 to 1,000 ends are drawn and spun simultaneously on modern spinning frames by the substitution of the finger hold to the continuous steel roller hold shown at *B*. The finger hold was soft and easy on the stock, and by covering the top rolls of the spinning machine the grip and the pressure on the stock are equally soft and easy.

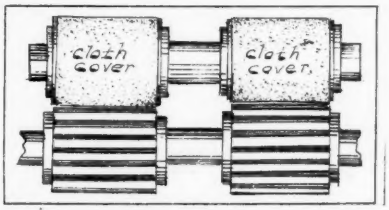


Fig. 3. The Same Rolls with Cloth Foundation Covers

Top spinning rolls, which were first covered with an efficiently milled, even fabric of uniform thickness forming a foundation for the outer covering, gave the best results. Yarn breakages were fewer, and a better balance of the twist was obtained. Rubber covering for top rolls has now attained a position of importance in the roller covering industry because evenly drafted and spun yarn has a direct commercial influence on the finished cloth. Spinning rolls not only have to be covered efficiently to do good work, but the covering must have proper upkeep. Rubber, leather, felt, or any other kind of covering cannot run indefinitely without care.

When the top rolls of a spinning machine are entirely bare, they appear as shown in Figure 2, and the roving in passing between them will be more or less crushed between two metal surfaces. The same rolls, after the foundation cloth has been put on, are shown in Figure 3.

The bosses or raised parts of the bare rolls must be properly covered with substantial woolen cloth. Shoddy or cottony cloth will not do as it lacks the springy character of wool, and a certain degree of springiness is needed although not to the extent of being spongy. Sponginess usually happens if the cloth base is not full enough to fill out the rubber cot sufficiently, a condition which occurs when it is not the right thickness. Nor should the cloth base be so thick that the rubber cot will be extended excessively. This shows the necessity of getting the cloth from firms that specialize in the proper brands, and also the importance of having the rubber cots put on by men who know how. Even the paste which is used to fasten the cloth to the metal surfaces of the rolls should be special. Glue may be used, but it usually sets too hard and makes the cloth take on a harshness that is not good for the rubber surface. Cement

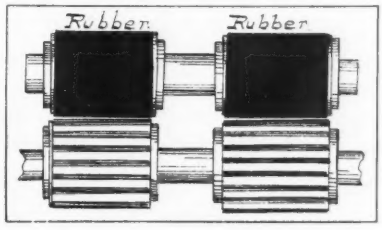


Fig. 4. Rubber Cots Slipped Over or Pasted on Cloth Covers

or white lead gives much better results as an adhesive.

Cloth should be used which has had all of the shrinkage taken out of it because if the moisture set up by the paste starts the cloth to shrinking, it may open where lapped. It is best to use paste made of five pounds of finely powdered flour and one pound of similarly powdered rosin dissolved in sufficient water to give the mixture the consistency of a thick paste. Boil one hour, add a little turpentine, stir well, and apply with a brush.

Next slit the cloth into the proper widths to cover the rolls and then cut these strips into the exact lengths to cover the rolls perfectly without lapping at the joints or leaving gaps. The paste can be put on the rolls with a brush, or it can be placed on a felt pad and the rolls turned on the pad to take on the paste. The cut pieces of cloth are then applied, one piece for each roll, the cloth smoothed with the fingers, and the joints matched as closely and evenly as possible. After the cloth has dried on the rolls, the rubber cots can be slipped on, thus putting the top rolls into the running condition shown in Figure 4.

In some cases the tight fit of the cots to the cloth foundation is enough to hold them securely in place for the average run of material spun on the spinning frames. Not much stress is put on roll covers when fine counts of yarn are spun. But when coarse tow yarns or yarns of a similar nature are in process of being drawn and twisted, the stresses upon the cots are greater; and to prevent them from loosening, the paste is used between the rubber and the cloth surfaces.

The rubber cots are dyed special colors because it is much easier for the operator to see a roll running without its sliver of stock if the rubber cover is a different color from the stock. Broken ends run to the floor and make waste. The breaking of a white end out of a white covered roll would be noticed sooner if the cover of the roll were yellow, brown, or orange, rather than white. Consequently rubber cots are made in contrasting colors from those of the textile stock in process of spinning.

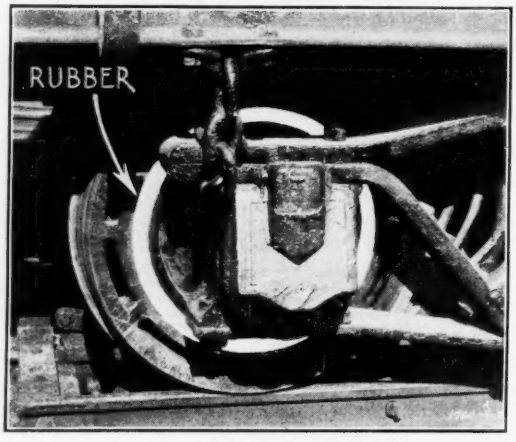
Rubber cots on top spinning rolls should have proper care. Under normal air conditions in a mill equipped with humidifiers or even without air control apparatus they will not be affected any more than any other kind of cots. Careful operatives wipe off any extraneous matter at the end of the day, and no harm is done to the rubber. When loose dyestuff or chemical substance is left on the cots, changing air conditions are liable to bring about an early deterioration. Therefore the covers should be kept clean and given as much attention as the spindles, the driving bands, and the mechanism of the spinning machine itself.

Rubber Cushioned Car Wheels

The Unique Characteristic, Peculiar to Rubber Under Compression, of Absorbing Shocks and Noise, Has Engaged the Attention of Engineers of Motive Power and Rolling Stock Divisions of Principal Railways in the United States and Canada

A RUBBER cushioned car wheel for railway passenger and freight cars has been in process of development over a period of years by the engineering department of The Goodyear Tire & Rubber Co., Akron, O. This patented wheel here pictured was designed and perfected by E. F. Maas, of the engineering staff of the company.

Many puzzling phases were overcome before the cushioned wheel was finally evolved under rigid laboratory tests. In April of this year the wheel was put in service under the tender of a locomotive operated by the Akron, Canton & Youngstown Railway, where it has been rigorously tested over many hundred miles on heavy grades, sharp curves, and over rough road beds.



Goodyear Cushioned Car Wheel

The cushioned wheel is made much like the ordinary all steel car wheel except that a cushion of uncured rubber is built between the hub and the rim. After this operation the wheel with the rubber is put into the vulcanizer and cured in much the same way as a solid rubber truck tire is vulcanized firmly to its metal rim. A pocket within the wheel holds the rubber pad, which is about 2½ inches thick, by 6 inches wide and tapering to a thickness of about 1¼ inches. This beadlike projection is the only portion of the flexible pad that is visible on the surface of the wheel.

The tests made on the A. C. & Y. engine indicate the entire feasibility of the invention and show that the rubber cushion can be adapted to large wheels, flexible couplings for shaftings, and even to the drive wheels of the largest locomotives. It will enable locomotives to start with greater smoothness, thus saving wear on each of the countless appliances essential to locomotive efficiency, thereby reducing maintenance costs.

It is obvious that heat is generated in a car wheel when brakes are applied, but the rubber cushion is not affected because the ventilation secured by large openings in the disk-like wheel, give the effect of a set of spokes between steel tire and steel rim.

When the steel tire is worn out, it can be removed, the rubber detached, and the old hub again used in the construction of another complete wheel. This operation can be repeated indefinitely; while the ordinary wheel, when no longer usable, must be sent to the scrap heap in its entirety. Thus another item of economy results from the cushion wheel. The success of the invention has encouraged absolute faith in the feasibility of the appliance and confidence that it is destined to become a potent factor in the future of railroading.

Rubber Power Transmission Belting—II[1]

Testing Methods for Determining Strength of Ply Adhesion in Belting

W. L. Sturtevant

THE quality of rubber belting is often judged by the strength of adhesive rubber bonding uniting its fabric plies. The test measures the average force in pounds required to separate, usually at the rate of 1 inch per minute, the plies of a sample 1 inch wide. The sample is cut transversely or longitudinally from a vulcanized belt, the direction being regulated by the width of the belt to be tested. Samples are taken longitudinally from belting up to 8 inches in width and transversely from belting over 8 inches in width.

The amount and the direction of the force applied during this test has little or nothing in common with service conditions; therefore it is generally recognized that the friction pull of a belt is not necessarily indicative of its performance in actual service. The friction pull test may be considered as showing comparative quality rather than an indication of service value.

Ply Adhesion Testing Methods

There are several methods of performing the adhesion test on belting. The most commonly used is the dead weight test in which the sample is secured to a support at one end and the plies are stripped down by means of a weight fastened to the end of the ply under test. After a specified period of time the weight required to separate the plies at a definite rate of speed is noted. The manner of conducting the dead weight test may vary by stripping two plies instead of one or by testing the sample against a flat surface or over a drum.

Several variations of dead weight testing are in use as illustrated in Figure 1. In that specified by the American Railway Association (A. R. A.) the test strip is 6 inches long. Two test specimens of two plies are taken from this strip and tested individually. The plies are separated by hand at one end of the specimen for a sufficient distance to permit attaching the grips. One separated end is clamped in a stationary grip; the other separated end is clamped in a freely suspended grip hanging vertically, to which the prescribed test weight is attached with suitable provision for supporting and slowly releasing it without jerking. The weight required to separate the sample and the distance through which the separation takes place are noted over a period of 4 minutes during which the total separation shall not exceed 4 inches.

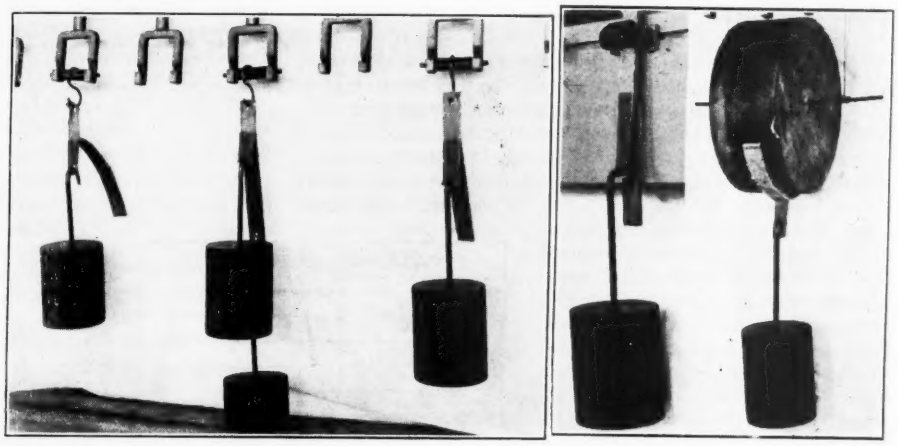
The method specified by the Rubber Manufacturers' Association (R. M. A.) is regarded as satisfactory and is in general use by American rubber belting manufacturers. According to this method the test specimen is cut 1 inch wide, longitudinally from belts under 8 inches wide and transversely from belts 8 inches and over in width. A minimum weight, sufficient to maintain the test specimen approximately vertical during the test, is attached to its lower end. The weight that measures the friction pull is attached to one of the plies, and the time rate of separation is noted. This factor and the weight are correlated to express the numerical value of the adhesion test. The last two plies are omitted from the test because sufficient rigidity cannot be maintained to obtain separation in an approximately vertical plane, and the test would show a result somewhat lower than the true value.

In the free hanging method the sample has no other support than suspension in the clamp with the test weight hooked to the ply under test.

In the board method the sample is tested vertically against a board, the latter performing the same function as the weight in the R. M. A. method: that is, it maintains the sample in a vertical plane during the test.

In the mandrel method the test piece is tacked to a circular block of wood suspended by wire loops passed around a rod serving as a shaft upon which the circular block is free to turn as the ply separates under test.

The adhesion test may be performed on a machine which autographically records the results on a chart, giving a permanent record of the test. The speed of jaw separation must be uniform during the test as varying speeds will influence



A.R.A. R.M.A. Free Hanging Board Mandrel

Fig. 1. Adhesion Testing Methods

[1]Continued from INDIA RUBBER WORLD, Oct. 1, 1930, pp. 59-60.

results. The machine test eliminates the personal equation, which is an unavoidable factor in the dead weight test. The standard speed of jaw separation is 2 inches per minute; the standard rate of separation of the sample is 1 inch per minute. Plies may be tested by pulling them singly, or two plies may be pulled, separating one ply from the other after removal from the belt, as outlined under the A. R. A. dead weight method.

An autographic friction testing machine of approved type is illustrated in Figure 2. Some features of a well-known rubber tensile testing machine are combined to form this effective motor driven testing unit.

The rack *A* of the transmission box *B* is attached to a cross arm *C* carrying the movable jaw *D*. The top jaw *E* is attached to a chain connecting it with the spring of the indicator *F*, which is fastened to a fixed cross arm *G* at the top of the machine. A recording drum *H* is revolved by a pulley and cord arrangement *I* connecting with the movable cross arm *C*. The design of the machine is such that the plies separate at the constant rate of 1 inch per minute, and the force resisting the separation is variable. This pull on a 40-pound spring is recorded on a chart, placed around the drum *H*. See Figure 3.

A quick return mechanism is a feature of the transmission box, the return of the movable cross arm to its initial position being almost instantaneous.

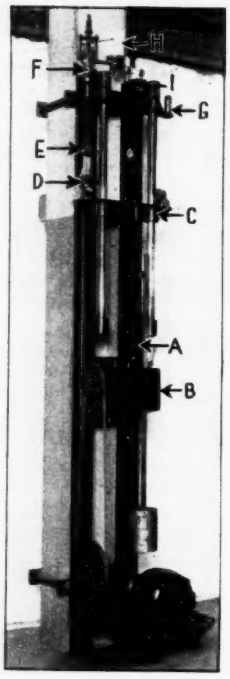


Fig. 2. Autographic Friction Machine

Comparison of Methods

Friction tests on identical plies of the same belt by the dead weight method and by this machine are compared in Figure 4. The full lines indicate the results by the machine method, and the dotted lines those by the dead weight method. The minimum friction test of a belt is the one of critical interest. This value is definitely shown by the dead weight method and in the majority of cases agrees with the figures obtained by the machine method.

TABLE I

	Adhesion Test, Ply Separation 1" Per Minute, (in Pounds)	
	Lengthwise	Crosswise
Dead Weight Method		
R. M. A.	25-26-23	23-26-26
A. R. A.	21-21	21-22
Board	27-27-24	24-25-24
Hanging free	23-24-25	22-25-21
Mandrel	36-39-36	36-39-36
Machine Method—1 ply	22-28	21-29
Machine Method—2 ply	20-28	20-27

The results obtained by the various methods of performing the adhesion test are shown above. Samples were taken from a 2-foot length of belting containing a standard 32-ounce duck, having the following construction: plies 7 warp by 6 filling; threads per inch 23½ warp, 14½ filling. Conditions were standard throughout the test, the temperature 75° F., relative humidity 40 per cent. The belts were 5 ply and all plies skimmed.

The results in Table I indicate that different test methods influence adhesion tests to a considerable degree. The mandrel method, where the load is applied at right angles to the plane of separation, gives higher results than the methods where the load is applied at different angles. It is evident that a standard test method should be specified for adhesion tests.

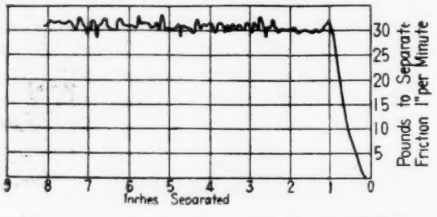


Fig. 3. Friction Test of Transmission Belting

Effect of Age, Heat, and Water on Ply Adhesion

Rubber compounds for transmission belting must withstand a continual flexing action in service, and consequently the compounds must retain their original characteristics of strength and high flexibility over a long period of time. At the time of manufacture belts are tested for adhesion, and the samples are filed to be retested at the end of one year, and the results compared with the original tests. Table II summarizes four monthly adhesion tests conducted on high grade transmission belts one year old.

Water, Brine, and Hot Air

The effect of water, brine, and hot air on ply adhesion was determined by the Rubber Manufacturers' Association dead weight method. The test pieces were cut from 12-inch wide belt samples, and the "Before and After" tests were made on the same 1-inch test piece in each instance. The water, brine, and heat exposures were 120 hours each, as stated in Table III. Each test was made in triplicate. The results indicate that the quality of the adhesion was affected only by the heat test and in that case only very slightly. The tests may be classed as indicating the quality of the belts although the results would be influenced by the rubber compound used and its state of cure.

TABLE II

	Percentages of Plies			
Unchanged	26.60	22.00	12.60	18.20
Gained	73.40	78.00	87.40	81.80
Original testing 24 pounds and over	50.00	66.00	73.60	62.50
Retest 24 pounds and over	65.80	74.00	84.00	79.00

Natural and Oven Aging Compared

The effects of natural and oven aging are compared in Table IV. In these tests adhesion is not affected until the eighth day of oven aging. Four days of oven aging under the above conditions are considered the equivalent of 2 years' natural aging. After 2 years' natural aging the adhesion test is only slightly affected.

TABLE III

	Adhesion Test (in Pounds)	
Conditions of Test	Belt A	Belt B
Before immersion	24-26-27	24-25-26
One hour after immersion in water at 78 to 92° F. for 120 hrs.	26-26-26	26-25-25
Before immersion	24-25-26	25-25-25
One hour after immersion in water at 180 to 212° F. for 120 hrs.	23-22-22	23-22-22
Before immersion	26-24-27	26-24-22
Immediately after immersion in brine at 20 to 23° F. for 120 hrs.	26-25-25	26-26-25
Before exposure to heat	25-25-26	24-23-22
Immediately after exposure to air at 21 to 24° F. for 120 hrs.	26-25-25	25-25-25

The effect of tensile strength and elongation of a rubber compound on the adhesion test of a belt is shown in Table V. These data were secured by examining a great number of factory control

TABLE IV

		Adhesion Test (in Lbs.)
Before aging		22-24
After oven aging at 158° F.	4 days	20-25
	8 days	19-22
	12 days	18-21
After natural aging in storage	1 year	23-24
at room temperature	2 years	21-23

tests extending over a period of one year. The results show that in order to obtain higher adhesion tests, ten-

sile strength and elongation tests must be increased to a point much greater than that indicated by the direct relation of the adhesion test. For example: to secure an increase of 64 per cent (from 14 to 23 pounds) on the adhesion test, an increase in tensile strength of 133 per cent (from 1,200 to 2,800 pounds) was necessary, and an increase in elongation of 34 per cent (from 560 to 750 per cent) was necessary.

Effect of Number of Plies

The results in Table VI represent tests by the dead weight method against a board over a period of about 3 months to determine the effect on the adhesion tests of the number of plies in a belt. The tests are average figures and indicate a definite tendency: namely, that as the number of plies is increased in a belt containing the same friction compound, the better the resulting tests, owing to the greater rigidity of the test sample. All of these belts were produced under a factory control system which includes the testing of every batch of mixed stock before it is released to the production department. All fabrics are tested to specifications and examined for construction, and every finished belt is tested to definite specifications before shipment. Under such conditions variations in manufacture are reduced to a minimum.

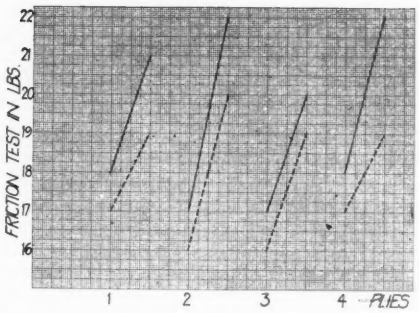


Fig. 4. Machine and Dead Weight Methods Compared

TABLE V

	Adhesion	Tensile Strength	Elongation, Per Cent
Belt A	23	2,800	750
Belt B	17	1,900	630
Belt C	14	1,200	560

TABLE VI

4-Ply Belt		6-Ply Belt		8-Ply Belt	
Number of Tests	Adhesion Test, Pounds	Number of Tests	Adhesion Test, Pounds	Number of Tests	Adhesion Test, Pounds
426	22½	492	23¼	161	24½

(To be continued.)

Dutch Native Rubber

Native Rubber of the Netherlands East Indies Was Known to Be a Serious Factor in 1924

SIX years ago an American, Fred T. P. Waterhouse, returning from a trip into the native districts of the interior of Sumatra, reported that native rubber planting in the Dutch East Indies was increasing so that the native crop would soon become a factor to be reckoned with.

It is interesting to note from the 1924 files of the Malay papers how little was known at that time as to the actual situation. The following quotations from his statements published six years ago are indeed prophetic.

Native Rubber a Serious Factor

"Mr. Fred T. P. Waterhouse has just undertaken a long trip through the Palembang and Djambi districts of Sumatra, in the course of which he penetrated many miles into the interior and had unique opportunities to see for himself the magnitude of the native rubber production. He was much impressed by the large quantities of native rubber coming from these districts and by the even greater possibilities for the future, and he fails to see how the Dutch authorities, even were they disposed to do so, could hope to apply restriction over this form of produce. Mr. Waterhouse holds the opinion that Mr. Lowther Kemp's letter which was published recently is on the right lines. His opinion is based on the observations he was able to make during this trip. He has a commercial interest in the native product and, consequently, had exceptional facilities for coming into contact with the facts; and he believes that native rubber production is now of such an extent and is capable of such expansion that it cannot fail to have a very decided effect in the not far distant future upon the general rubber situation of the world." *Straits Times, August* 18, 1924.

"I am certain," Mr. Waterhouse declared finally, "that 1s 3d and 1s 6d as a restriction basis is too high and should be lowered. As to the extent to which it should be lowered, I am not going to say. It is a matter for careful investigation and study. I think the estates must be organized to do business on 30 cent rubber[1]. If they cannot do that, then it is not worth while for them to continue as a permanent investment. At the moment with 50 cent rubber the native production is being subsidized, while this country is itself restricting." *Singapore Free Press, August* 20, 1924.

The Native Rubber Danger

In a leader headed "The Native Rubber Danger," it stated that: "Mr. Waterhouse has produced sufficient evidence, were that needed, of the enormous extent to which native planting in the Dutch East Indies has grown; and he has further exploded the comforting conviction, which some were hugging to themselves, that this production could not last long because, even if these native planted trees did exist, they were all being overtapped and could not last long." *Singapore Free Press, August* 21, 1924.

In reply to an editorial accusing Mr. Waterhouse of "romancing" and being an anti-restriction propagandist, the Editor of *Malay Mail,* on September 2, 1924, received the following from Mr. Waterhouse:

"It seems that if anyone suggests that today conditions may have arisen which were not anticipated in the Stevenson Committee's report, and that it is serious enough for investigation, one is immediately accused of having ulterior motives or classed as being an anti-restrictionist.

"I am a buyer of rubber, and my trip to Palembang and Djambi was in connection with this business.

"As our firm deals largely in native rubber, we are concerned with the future supply. One-third of the crop from the Malay Peninsula has been estimated to be native and Chinese rubber, and over 50,000 tons, dry weight, will come into Singapore from Dutch territory this year. I have satisfied myself that it is impossible for the Dutch to restrict production of native rubber even if they wished to, and I am further satisfied that restriction in Malaya and Ceylon will keep the price at a figure that will encourage further native planting and stimulate tapping, resulting in an increase of next year's crop from the present areas.

"Should restriction be removed there is the danger that the price of rubber would fall to such a point that the Singapore mills would suffer greatly from a shortage of supplies."

[1] Straits currency equivalent to 18 cents on the New York market.

The German Rubber Association

This Concludes the Abstracts of Papers Read at the Fourth General Meeting of the Deutsche Kautschuk Gesellschaft (German Rubber Society) Held at Frankfurt a. Main during June 15-16

On the Protective Action and Changes of Antioxidants. By F. Kirchhof. A series of technically important antioxidants was tested with regard to their reaction to light, air, and chemical agents. As the author was able at the time to prove (in 1927), most antioxidants are characterized by intense luminiscence when observed under the filtered ultra-light of the quartz lamp. Good use was made of this phenomenon in the present investigation, it being found possible also to follow the various changes in the protectors. The following antiagers were more thoroughly examined: Age-Rite powder, said to be phenyl-b-naphthylamine, Aldol-a-Naphthylamine, here briefly referred to as Aldamin, besides Stabilite-ethylene-diphenyldiamine and Stabilite-alba-ethylene-diphenyldiamine.

It is well known that most of the antioxidants change their color on exposure to light and air, a change which particularly in their solutions can be observed even after a short time. Thus approximately 1 per cent benzol solutions of the three most usual antioxidants, put up in sealed quartz glass tubes and exposed to the light of the sun and the light of a quartz-mercury lamp (220 V., 4 Amp.) respectively, at a distance of 35 cm., showed the following changes in color:

	Original Color of Solution		After 3 Hours' Exposure to Sunlight and U. V. Light Respectively	
	In Visible Light	In Filtered U. V. Light	Color in Visible Light	Color in Filtered U. V. Light
Aldamin	Lemon yellow	Intense light blue[1]	Brownish yellow	Violet
Age-Rite	Light brown	Intense violet[2]	Dark red-brown	Violet
Stabilite Alba	Faint pink	Intense lavender blue[3]	Faint brown	Very faint brown
Stabilite	Yellow brown	Faint greenish	Brown	Faint green
Stabilator	Red brown	Intense blue violet	Intense red-brown	Faint reddish-brown

[1] Solid = emerald green. [2] Solid = violet. [3] Solid = intense violet.

Analytical paper filter disks first impregnated with the benzol solutions showed similar photo-chemical changes. For the same periods of exposure the changes were most marked in the case of Age-Rite and Stabilator and least in the case of Stabilite Alba.

As the above reactions show, the luminescence of the solutions exposed to the air disappears in a relatively short time. As further tests proved, the dark-colored transformation products showed no luminescence or only faint luminescence as compared to the original tests. Another test concerned the change in the antioxidants caused by oxygen but with the light excluded. Pure oxygen was passed through 7 per cent filtered benzol solutions of the first three antioxidants named above, for 5 days. The solutions which had become markedly discolored in this time (the Age-Rite solution the most) were extracted with alcoholic potash lye; the extracts washed with benzol, decomposed with dilute hydro-chloric acid, dissolved in ether, evaporated, and weighed. For every 5 grams of the original substances dissolved in benzol, the following ether residues were found: Age-Rite, 0.085 gr. or 1.17 per cent; Aldamin, 0.063 gr. or 1.06 per cent; Stabilite Alba 0.35 gr. or 0.7 per cent, calculated on the original substance.

These acid, resinous products, colored intensely red-brown, showed no luminescence at all (Age-Rite), or only faint greenish-brown luminescence (Aldamin and Stabilite), and therefore behaved in a similar manner to the transformation products developing under the influence of light. From a quantitative point of view, too, the change brought about by oxygen was greatest in the case of Age-Rite and least in the case of Stabilite Alba. However, these acid oxidation products are not the only cause of the dark coloring of the oxidized benzol solutions. The benzol solutions extracted with alcoholic alkali also show the characteristic colorations of the original solutions after oxidation and exposure to light for moderate periods.

The addition of salts of heavy metals to the solutions of the antioxidants has an effect exactly analogous to that produced by exposure to light and oxidation. Thus the ultra-violet luminescence of the three above-named antioxidants in alcoholic solution disappears with the addition of a few drops of the alcoholic solutions of ferric chloride, cuprous chloride, trichloride of antimony, stannic chloride. The disappearance of luminescence is absent when alcoholic potash or aluminum chloride is added. The heavy metals mentioned above, therefore, act as oxidation catalyzers on the antioxidants, probably with preceding formation of complex metal compounds. The quantitative side of these relations, which is important for the question of immunization of rubber against heavy metal poisons (oxygen catalyzers), is followed up.

Finally the purely mechanical protective action of some oxidants (*sic*) on rubber was tested; the protective action seems to depend on their solubility or insolubility in this substance. Para solutions with 10 per cent of antioxidants (calculated on the rubber) were allowed to evaporate on quartz glass plates to films of a thickness of 1/10 mm. and then exposed to the action of natural and artificial sources of light, in which the filter action of the antioxidants added was calculated by means of the blackening of photographic papers placed under the plates. Ultra-violet light gave the following results:

	Appearance of the Film		Filter Action for U. V.
	In Ordinary Light	In Filtered U. V.	
Age-Rite	Light brown, opaque	Intense violet	Powerful
Aldamin	Light yellowish, opaque	Intense light blue	Very powerful
Stabilite	Perfectly clear	Faint dark violet	Very feeble
Pure Para	Perfectly clear	Very faint dark violet	Very feeble

As was the case with the intensity of the coloration of the films in filtered ultra-violet light, the optical mechanical protective action of Age-Rite and Aldamin was also very powerful; while on the other hand it was weakest with Stabilite, which is also most soluble in rubber. Since it is known that pure rubber is extremely transparent to ultra-violet light, this optic-mechanical protective action of antioxidants has a certain practical significance in mixes free of fillers or poor in fillers.

Thus the above rubber films showed the following changes after having been exposed to ultra-violet light for six hours:

Conditions of the Films After 6 Hours' Exposure	
Age-Rite Film.	Slightly sticky, very much darkened.
Aldamin Film.	Perfectly dry, slightly darker.
Stabilite Alba.	Very sticky, slightly darker.
Pure Para Film.	Very sticky, slightly darker.

However, the changes in color of an antioxidant is no measure of its surface protecting action. Its solubility and the type of the dispersion in rubber play an important part. Micro-photographic pictures (see original treatise) of the films of 1/10 mm. thickness show the distribution of the antioxidants mentioned above (for a content of 10 per cent) in the rubber film.

Age-Rite.	Thick clusters of crystals, unequally distributed.
Aldamin.	Small fine crystals, equally distributed.
Stabilite Alba.	A few little drops, all the rest dissolved in the rubber.

From the luminescence, microscopic, and photo-chemical behavior of Age-Rite and Aldol-a-Naphthylamine it also follows that these two substances cannot be chemically identical, which, as far as the writer knows, has as yet nowhere else been distinctly referred to.

Summarizing, it may be said that the protective action of the antioxidants examined is at the same time optic-mechanical and chemical. While as far as the mechanical protective action is concerned,

both the unchanged (undissolved) antioxidants and those that have changed color come in for consideration; the chemical protective action seems to be due to the unchanged, highly luminescent parts of the antiagers. The latter are also of considerable interest in connection with the question of the immunization of rubber to soluble heavy metal combinations.

The Development and Standardization of Rubber Testing by Means of Ozone. By E. P. Kearsley, Chicopee Falls, Mass. Proceeding from the well-known fact that rubber ages owing to the influence of light and air, the author, by way of introduction, touches upon the works in which the cause of the phenomenon is found in the action of oxygen. These aging phenomena, as other investigators had already demonstrated, can be accelerated and made more noticeable when rubber, under tension, is exposed to the action of ozone. Up to the present the difficulty working against the obtaining of comparable results has been the impossibility of being able to get ozone in comparable concentrations for the tests.

The author discusses a method which permits the action of constantly comparable quantities of ozone and suggests that on this condition it is possible to obtain constant and comparable values. It is further shown that the results yield valuable relations concerning the behavior of the most varied compounds and in particular permit a choice of compounds which resist the action of ozone to a remarkable degree. Suggestions are offered as to how the characteristic brittleness resulting from the action of ozone can be avoided. The necessity for really intensive investigation in this direction and the possibility of comparing the results obtained with aging by means of ozone and the results of natural aging are emphasized.

Organic Colors in the Rubber Industry. By F. Jacobs, Paris. Works or lectures on rubber colors, which have so far been published, refer almost exclusively to the colors produced in one country or only those produced by a certain firm. The results are therefore hardly suitable for purposes of comparison, or only to be used with great reserve. Detailed, systematic experiments were carried out under the most diverse circumstances in regard to the resistance to light, air, and vulcanization, of the most important rubber colors of American, English, German, and French origin, and the results obtained were discussed with the aid of samples presented.

X-Ray Investigations of Gutta Percha and Balata. By G. v. Susich, Ludwigshafen a. Rh. (After experiments carried out in cooperation with H. Hopff.) By means of the X-ray it was proved that (1) the hydrocarbons of gutta percha are perfectly identical with those of balata, but differ from those of rubber, and (2) that the gutta percha hydrocarbons are present in two polymorphous modifications in which the point of transformation is at about 55° C. The modification which at ordinary temperatures is stable is also crystalline in unstretched condition; the modification which is stable at more than 55° C., on the other hand, (as in the case of rubber at ordinary temperature) is amorphous when not stretched; stretching in heat makes it crystalline and orientated. From the fiber diagrams of stretched and frozen test pieces an identity period of 4.6 and 9.2 A units respectively can be calculated.

The X-ray observations of G. L. Clark, E. A. Hauser, and E. Ott, which in certain points are contradictory, are discussed and partly explained by the presence of the two modifications.

Hydroquinone as an Antiager

Assuming polymerization to be the fundamental process involved in vulcanization, the aging of rubber may best be regarded as involving its further polymerization by means of atmospheric oxygen, a well-known polymerizing agent; and aging is retarded, says G. Stafford Whitby, when polymerizing is checked. Hydroquinone, for example, checks it because it is an anticatalyst for polymerization, preventing it in rubber just as it prevents it in acrolein, styrene, and certain other polymerizable compounds. Hydroquinone in a solution of ether or other solvent, or in vapor form, is also advocated by the French chemists Moureu, Dufraisse, and Lotte as an age-resisting application for rubber goods. They claim, too, that the effect of this and various phenolic "antioxygènes" is much more than skin-deep and that rubber and its products thus treated can withstand some remarkable tests.

Rubber Reclaiming and Its Hazards[1]

A. P. Regal[2]

IN this paper the author reviewed in considerable detail the steps in the reclaiming of rubber by the alkali and acid processes from stock pile to finished product, and from experience cited the points specially liable to cause accidents to those operating the machines, and process details. Concerning the general hazards of reclaiming the author remarked as follows:

"The accident experience of the industry in the past has not been particularly good, whether due to unusually dangerous equipment, or to failure to keep pace with our friends in the safety movement, may be a question. However, let me call attention to some possible reasons. The largest reclaiming plant does not employ over 500 men and when compared with establishments of similar number of employes, in other industries, our experience is favorable. Again, some 40 hp. of power is used per employe, an unusually large amount, indicating that the quantity of machinery per employe is large, naturally meaning increased hazard. Even then, most of our accidents, especially serious ones, are due to causes not peculiar to the industry, with the possible exception of burns and scalds, to which our processes render us particularly liable."

The experience of the author leads him to the following conclusions on safeguarding the workers in reclaiming plants from personal injury in their operation:

"In surveying potential hazards, or in considering a situation where an accident has occurred, there is an unfortunate tendency, especially on the part of those responsible for spending money, to take the attitude that since this is the first time an accident like this has happened, and, since probably it will not happen again in a thousand years, therefore the spending of good money to correct the situation is not warranted. Of course the answer, and the only possible stand taken, must be that every place where an accident has occurred, or where there is a possibility of accident must be made safe; that there will be injuries a-plenty from causes difficult to anticipate, or from overlooked hazards.

"It is taken too much for granted even today that a reclaiming plant, because much steam and water are used, must be sloppy. We know that such processes can be kept clean, and equipment so arranged that hazard is reduced to the minimum. Light, in such locations, is a valuable aid to safety. Cleanliness and order, throughout, are so tied in with good management and efficiency, that it would seem unnecessary particularly to demonstrate how intimately they are connected with safe operation and low cost production. Yet there is many an earnest foreman who fails to realize this relationship until the safety engineer or superintendent has convinced him by object lessons or data. We do not believe any one theme can better be continuously, persistently, hammered on than this, "cleanliness and order."

"All in all, the hazards in the reclaiming plant differ little from those in your own factory, and success in safety work with us depends upon carrying out the same methods which have reduced your accidents. We must constantly check our equipment, to see that guards are not laid aside. We must constantly watch for that unappreciated accident opportunity, to rectify it before the accident occurs.

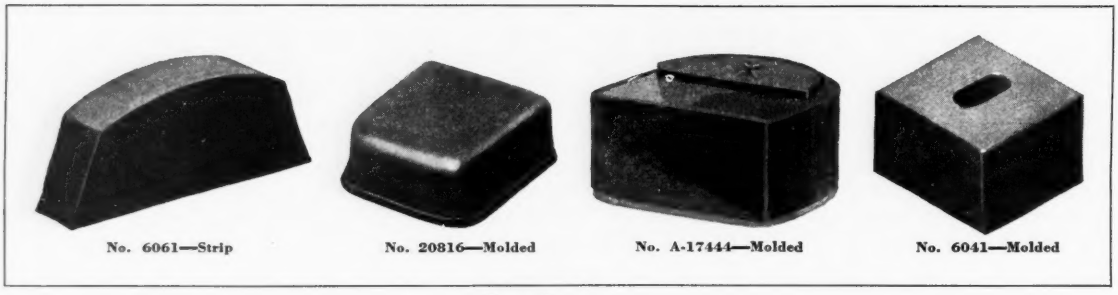
"We must use every facility reasonably available to us, posters, bulletin boards, contests, and other graphic means to arouse and maintain interest.

"We must keep constantly before our own minds, as well as before the workman's mind, that accidents are avoidable. We must eternally educate and constantly change our appeal so that it comes freshly to the men. We must so reiterate safety to our employes that their mental attitudes will change, that safe thinking will be normal to them, that chance-taking will cease. A task, for our traffic casualty reports indicate how deeply rooted carelessness is, but how worthy a task! And what a reward to know that some of our comrades now alive and whole, but for our work would have died or been maimed, that homes are happier and misery less, because of our efforts!"

[1]Paper read before the 19th Annual Safety Congress and Exposition—Rubber Section, Pittsburgh, Pa., Sept. 29 to Oct. 3, 1930.

[2]Process Engineer, Philadelphia Rubber Works Co., Akron, O.

Silencing Rubbers[1]



Door Bumpers

Rubber Products That Contribute Silence and Comfort to Automobile Bodies

DURING the popularity of touring car models pneumatic tires were practically the only contribution by rubber to the riding comfort of automobilists. Now that closed car models have supplanted touring cars in public favor, many special forms of rubber complete riding comfort by silencing otherwise unavoidable noises due to vibrations in the car body, doors, and windows.

Body silencing problems were solved by developing several familiar types of rubber goods products: namely, channel rubber, tubing, bumpers, and weather stripping. These types in simple forms have long been used in railway and trolley car window, door, and seat equipment to minimize vibration and shock. The design and construction of closed car bodies have resulted in numerous detail modifications of silencing rubbers. Their production in heavy tonnage results from their general use as original equipment and far exceeds the repair demand, which is trifling in comparison.

Except for a few items that lend themselves to standardization no practical results have appeared from efforts made to have car manufacturers standardize their specifications for this type of rubber material. In the case of glass run channel and header rubber there is some trend toward the use of standard construction although there are several slight variations from the general section.

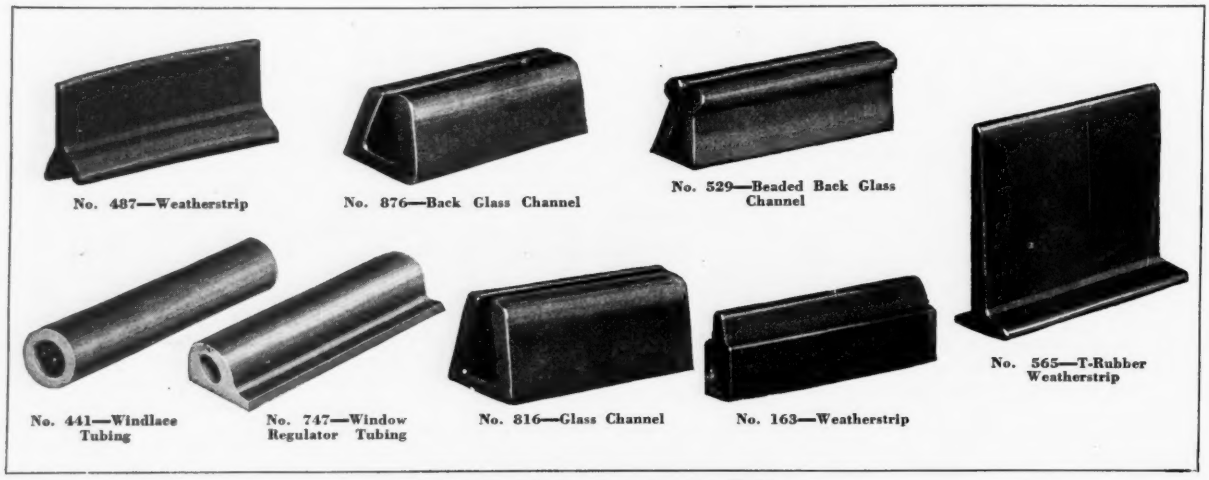
For the protection of glass, however, a distinct inclination exists among body builders to favor sponge rubber instead of solid rubber, and probably after a few years all glass run and header rubber will be made of sponge rubber. At present one finds a multiplicity of sections and construction particularly in channel forms. A few of these are pictured in the group illustrations. In fact, variations in size, shape, and construction of these goods are said to exceed 2,000 in number.

This condition would be incompatible with economy of production were it not that the expense of making a die to run any special section is a matter of minor cost importance compared with the expense of making a mold. This is fortunate in view of the rapid production of limitless forms that the rubber extrusion process makes possible.

Reference to the group illustrations of channels for window runs, windshields, door bumpers, etc., will make clear a number of type forms that are common in these products.

All sponge rubber channels and header strips are by necessity molded. Certain of the glass run sponge channels are covered all over with felt, velvet, or wool fabric applied by a special machine process. These fabric coverings serve not only to protect the soft sponge rubber from weather, but they afford a smooth sliding surface for the glass. Among the forms represented is a special molded fabric lined side channel made for one-piece windshields. Also shown is a tubu-

[1]Data and illustrations from Detroit Rubber Products, Inc., Detroit, Mich.



Miscellaneous Channel and Strip Rubbers

lar strip which serves as a resilient rest for the bottom edge of a windshield.

Another windshield rubber pictured is of rather complicated form. Its shape is such that it serves the double purpose of cushioning the bottom edge of the windshield and in so doing acts automatically to exclude rain. In this particular shape three closely grouped holes extend lengthwise through that part of the strip which dovetails into a retaining groove. They are thus positioned directly beneath the surface upon which the edge of the descending windshield presses. The holes, being open to the air at each end, readily collapse under this pressure, and when the windshield is fully seated, the top lip of the rubber strip is drawn automatically close against the glass, making against it a water excluding contact.

It is essential that the cross-sectional sizes and profiles of these rubber strips be maintained in all instances with exactness throughout their entire length in order to fit and function properly as appointments of the car body construction. This exactness of size and form is secured by skillful work on the part of rubber compounder, die maker, and tubing machine operator. The rubber mixing must be of such composition and plastic quality that it will not only run smoothly and correct to size from an accurate die but will vulcanize in open steam without porosity or distortion.

While the expense of molds and molding is thus avoided for strips of solid rubber, molding is essential for shaping sponge rubber in all forms in order to confine the pressure of the inflating gas within definite limits. Several sponge rubber channel shapes are pictured, all of which are fabric covered. As indicated above, the fabric covering adds both to the utility and finished appearance of the goods when located in car construction. Sponge rubber header strips represented by Nos. 6 and 10 are not fabric covered because they are used in locations where they function out of view of the car occupants.

Various other rubber strips for silencing and weatherstripping are made in prescribed lengths for both original equipment and repair work. For example, window header lengths are cut 24, 30, and 36 inches long. Certain windshield strips are 46 inches; others 50 feet. The latter is the usual length for most glass run channels, tubing, and weatherstrips. Door bumper tubed stock is cut in 24-inch lengths from which bumper blocks can be cut to fit in required lengths as illustrated by item 6061. Certain shapes of door bumpers require to be molded, as for example items A-17444, 6041, and 20816. Molded bumper forms, however, are relatively few owing to the extra expense of molds and molding.

The location and function of certain of the forms illustrated are not apparent to those who are not familiar with the details of car body construction. The following notes will serve, therefore, to identify them and explain their uses:

No. 747 is a window weatherstrip used on the inside of the door in connection with window regulators to serve as a water seal and antirattler.

No. 441 windlace tubing is used on inside body trim. It is usually covered with imitation leather or the material in which the body is trimmed, and applied around the doors to serve as a weatherstrip.

No. 487 is a T-rubber used ordinarily on the bottom of windshields. It is fastened by crimping into a metal stamping which serves to make the bottom of the windshield weathertight when closed.

No. 565 serves exactly the same purpose as No. 487, differing only in the shape of the head. This is to accommodate a different design of metal stamping on the bottom of the windshield used in some cars.

No. 163 is a weatherstrip used on the sides of windshields. This part is fastened into the windshield frame, and as the shield is opened, it brushes past the rubber strip. When the shield is closed, however, it serves as a weatherstrip on the side.

Many of the forms are of trivial size, running in some instances as low as 3/16-inch, and the largest cannot be considered otherwise than small. The gravity of the stocks employed is also low, indicated by such typical lengths as 19 feet per pound for item No. 529, ¼-inch, and 26¼ feet per pound for item No. 487, ½-inch.

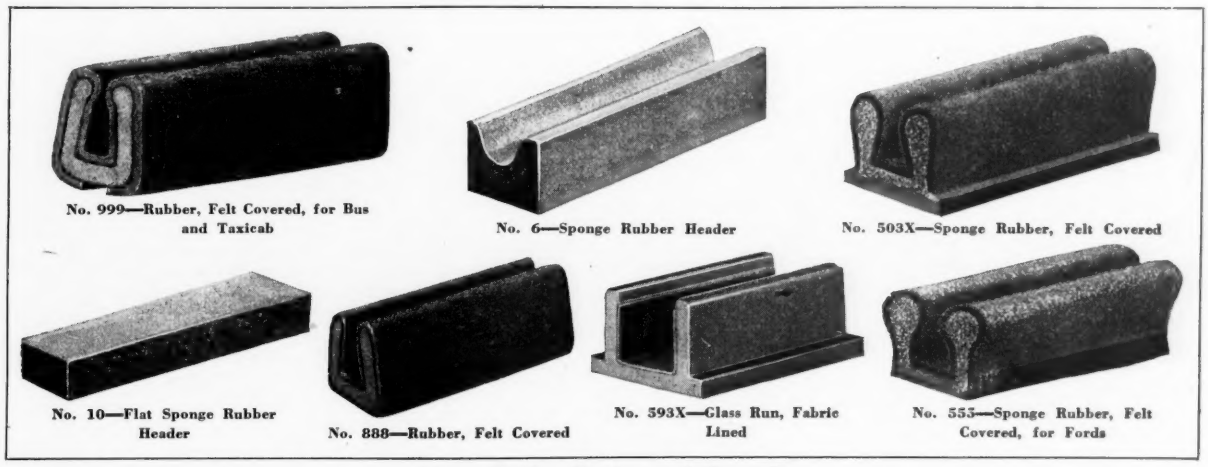
This line of rubber manufacture has, however, become an important specialty and accounts for a liberal tonnage of reclaimed rubber which enters largely into the solid strips and bumpers because of its plasticity, durability, and low volume cost.

No. 4631—Molded Fabric Lined Side Channels for One-Piece Windshields

No. 2643—Lower Windshield 3-Hole Weatherstrip

No. 574—Windshield Bottom Rubber

Windshield Rubbers



No. 999—Rubber, Felt Covered, for Bus and Taxicab

No. 6—Sponge Rubber Header

No. 503X—Sponge Rubber, Felt Covered

No. 10—Flat Sponge Rubber Header

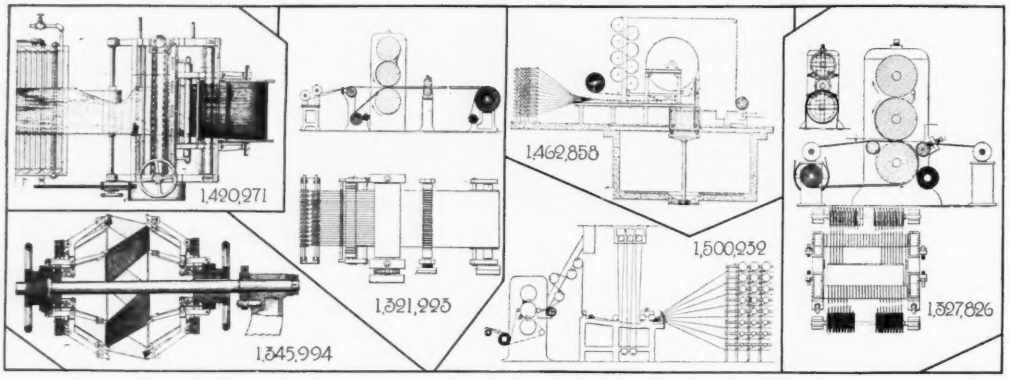
No. 888—Rubber, Felt Covered

No. 593X—Glass Run, Fabric Lined

No. 553—Sponge Rubber, Felt Covered, for Fords

Sponge Rubber Headers and Channels

Weftless Cord Fabric



THE following abstracts of United States patents relating to the manufacture of weftless cord fabric are continued from INDIA RUBBER WORLD, October 1, 1930.

21. Lister, 1,304,995. May 27, 1919. An apparatus for forming cord fabric comprising a segmented traveling core, means adapted to receive a portion of the core and to cause the segments of the portion to close and assume a substantially rigid arc-shaped form, and means separate from the means cooperating with the core to insure the proper closing of the segments thereof, and means for winding material about the core.

22. Seiberling, 1,309,424. July 8, 1919. A spool of cord is placed at one point in the machine, and the cord in passing through becomes impregnated with rubber, then wound on a drum, then a skim coat of rubber is applied to the covering of cords formed upon the drum, then this covering is cut on the bias into plies of the width required for building a tire carcass, the cut being so made that the cord extends diagonally across the ply.

23. Doolin, 1,311,857. July 29, 1919. A laminated fabric for tire casings has each lamina a strip of soft rubber and loose asbestos fibers embedded therein parallel to each other but oblique to the length of the strip, the laminae being vulcanized together with the strips in superposed relation, and the fibers in contiguous strips extending in opposite directions.

24. Brennan, 1,317,426. Sept. 30, 1919. A series of cords are fed through a tube forming nozzle by which the cords are arranged to form a tube but are not interwoven and are parallel with each other and with the axis of the tube. As the cords pass through the nozzle, they are coated with undissolved rubber in its normal dry state. The tube thus formed is then slit so that it may be opened to form a strip of the desired width.

25. Marquette, 1,321,223. Nov. 11, 1919. The process consists in passing a series of strands in spaced relation between rollers and at the same time supplying covering webs to the strands and between the rollers, with rollers spaced sufficiently to insure that the webs are not substantially forced between strands, and then passing strands and webs between rollers having flanges and relief surfaces between the flanges inserting the flanges between the strands to force the webs between the strands into adhering relation to the strands and to each other, while utilizing the relief surfaces to insure that the strands shall be subjected to no direct pressure from the rollers. (See group illustration.)

26. Midgley, 1,323,606. Dec. 2, 1919. This method of forming a weftless cord fabric consists in coating a carrier with rubber cement bringing a plurality of spaced parallel cords into contact with the coating, drying, stripping the cords and rubber from the carrier, and giving the fabric thus resulting a further coating of rubber.

27. Jameson, 1,327,826. Jan. 13, 1920. The apparatus comprises three superposed calender rolls positively driven at such relative surface speeds as desired. Arranged, each at a respective side of the lower roll, are strand-guiding rollers that receive a series of strands from supply means. The surface of these rollers has a series of strand-guiding grooves, and the grooves of one roller are staggered with respect to those of the other. (See group illustration.)

28. Boyer, 1,330,976. Feb. 17, 1920. Fibrous threads and soft uncured rubber in strip form are simultaneously applied onto a forming member, in the form of a rotary drum, and are pressed into a homogeneous body so that the individual threads will be embedded entirely in the rubber. The drum on which rubber and threads are wound and compressed is heated, and in addition heat is preferably applied to the exterior of the strip at and adjacent the point where rubber and threads pass onto the drum.

29. Converse and Butler, 1,337,690. Apr. 20, 1920. Adhesive cord strips are made by winding adhesive cord successively upon a series of alternately presented rotary supports to make a series of tubes, slitting a wound tube to form a strip, and removing the strip while another tube is being wound on another support.

30. Carlisle, 1,345,994. July 6, 1920. A band of material for use in constructing cord tires comprises a sheet of rubber carrying upon its surface a plurality of rubberized cords laid thereon in longitudinal engagement with each other and a plurality of narrow fabric strips located at intervals upon the exposed surface of the sheet of rubber and extending across it on the bias. (See group illustration.)

31. Baker, 1,355,525. Oct. 12, 1920. The method consists in continuously forming a plurality of cords helically about an advancing mandrel to form thereon a layer of cord carcass material, applying rubber to the material, applying heat to semicure it, then forming another layer of cords helically upon the mandrel and disposed thereon angularly, applying rubber to the second layer, applying heat to semicure it, and severing the superposed layers of cord carcass material to convert it to strip form.

32. Buchmann, 1,355,534. Oct. 12, 1920. A composite material is made by winding alternate fiber and rubber threads about a body of soft rubber, thereafter placing covering sheets of soft rubber upon the threaded surfaces of the body strip and then pressing the several layers together.

33. Morris, 1,358,094. Nov. 9, 1920. This relates to warp-producing means for looms, whereby the warp thread elements are grouped together in a fabric or partially formed fabric, preferably in connection with a selvage element.

34. Midgley, 1,370,339. Mar. 1, 1921. Making rubber covered strands consists in severing between adjacent cords a fabric composed of a plurality of parallel, slightly spaced cords, the fabric being coated with a tacky substance, forcing the covering substance against the sides of the separated cords, reassembling the separated cords in adhering parallel relation, and severing the reassembled fabric into longitudinal strips, each strip containing a plurality of cords.

35. Carlisle, 1,402,918. Jan. 10, 1922. The process consists in severing the weft

threads only of a strip of fabric, applying rubber to the tapes so formed, and in then cutting the homogeneous sheet to sever the warp threads of the fabric on the bias.

36. Fair, 1,405,992. Feb. 7, 1922. A series of spaced-apart cords are fed in two sets from opposite sides of an assembling zone, with the cords of each set registered with the spaces between the cords of the other set, feeding rubber between the two sets of cords, and associating cords and rubber by rolling pressure applied from opposite sides to interpose the cords of the respective sets between each other in the plane of the fabric and embed them in the rubber.

37. Brennan, 1,418,906. June 6, 1922. Stock is made by forming a tube of two layers of frictioned cord, one of the layers being parallel with the axis of the tube and the other of the layers of cord being at substantially right angles to the first of the layers, and then slitting the tube along the line on the bias with both layers of cord.

38. McLane, 1,420,271. June 20, 1922. A weftless cloth is produced by drawing a plurality of flexible strands in sheet formation through a bath of adhesive elastic material, maintaining the strands separately by substantial distances whereby the adhesive material will form a web between, and drying the adhesive material to form the finished product with substantial thickness of the adhesive elastic material between. (See group illustration.)

39. Krusemark, 1,422,451. July 11, 1922. The method of making two-ply tire fabric consists in winding a cord on a collapsible mandrel in the form of a flat tube, then shifting the mandrel members in opposite direction to move the cords into oblique relation to the mandrel, then applying a sheet of material to the outer face of the cord-coil thus formed to bind all the coils in their diagonal position with reference to each other and to the material, and next slitting the tube thus formed to enable it to be removed from the mandrel.

40. Hopkinson, 1,424,020. July 25, 1922. A process comprises coating a series of continuous cords arranged as warp-like elements, passing the series of cords through a latex bath, passing the coated cords on to a drying surface driving off the moisture from the latex while maintaining the cords in parallel relationship, and forming a continuous sheet of parallel cords joined together by rubber.

41. O'Neil, 1,437,859. Dec. 5, 1922. Cord fabric for tires is made by drawing the fabric lengthwise by means of calender rolls between which the fabric passes, in utilizing the rolls to apply raw rubber to both faces of the fabric and force the raw rubber into the spaces between the warp cords, and in applying to the fabric a degree of tension to straighten out all the waves in the warp cords, and produce a frictional fabric of uniform thickness throughout.

42. Swinehart, 1,437,870. Dec. 5, 1922. A tire cord comprises a circle of a number of twisted threads of fibrous material extending on straight parallel lines with each other and to the longitudinal axis of the cord and surrounding a central binding and cushioning core of rubber.

43. Hall, 1,444,070. Feb. 6, 1923. A cord tire fabric comprises warp-cords held parallel by fine widely separated filling threads in which is a progressive increase in the lengths of the cords from the center portion toward each edge, the total increase being within the elastic limits of the central cords.

44. Hall, 1,444,459. Feb. 6, 1923. The process consists in leading a web of closely arranged parallel cords through rubberizing calender rolls while maintaining the cords in the center portion of the web under greater tension than the cords in the edge portions.

45. Hopkinson and Jury, 1,462,858. July 24, 1923. This comprises an apparatus for manufacturing weftless fabric including independent sources of cord supply, means for assembling the independent cords in continuous sheet formation, a latex-filled container, means for passing the sheet of cords through the latex, a flexible carrier for receiving the wet sheet of cords and maintaining them in predetermined spaced relation, and means for drying the latex-treated cords on the flexible carrier in such predetermined relation. (See group illustration.)

46. Wayne, 1,464,632. Aug. 14, 1923. The process coats a fibrous cord with rubber under high pressure, thereby forcing the compound into the cord to insure perfect impregnation, and then laying lengths of this cord alongside each other while the coating is still plastic and in a condition to unite and form a single sheet of parallel cords embedded in rubber.

47. Jury, 1,470,924. Oct. 16, 1923. A rubberized cord fabric has a series of stress-resisting elements whose outlying fibrous strands are twisted together in one direction and a second series of similar elements twisted oppositely, a number of the elements of one series being alternated with a number of the elements of the other series to permit the fabric to lie substantially flat.

48. Hopkinson, 1,488,048. Mar. 25, 1924. The method consists in treating with latex and drying a plurality of independent cords to impregnate them with rubber without connecting them together therewith, advancing the cords in parallel relation, and pressing rubber composition onto and between the parallel cords to unite them together to form a sheet.

49. Pieraccini, 1,494,317. May 13, 1924. A fabric is composed of a warp of relatively closely spaced cords and a weft of threads diagonally disposed and spaced apart a distance comparable with the width of the fabric.

50. Castricum, 1,500,232. July 8, 1924. An apparatus for producing weftless cord fabric includes a calender to form and support a rubber sheet, a smooth surfaced roll to guide a series of cords into contact with the rubber sheet, means for moving the roll toward or away from the rubber sheet on the calender, a device positioned to arrange the series of cords in parallel relation on the roll, and means for adjusting the device to vary the spacing of the cords. (See group illustration.)

51. Castricum, 1,500,234. July 8, 1924. An apparatus for guiding parallel cords to a rubber coating calender comprises a roll upon which the cords may be arranged as desired for coating and a comb for so arranging them, having the free ends of its teeth extending toward the roll in overlapping relation therewith, constructed so that a knot in a cord will ride along the extended ends of the teeth, spread them, and drop onto the roll while maintaining its parallel relation with other cords.

52. Graubau, 1,509,202. Sept. 23, 1924. The method of making strands comprises adhering threads disposed in superposed layers with the threads all extending in the same direction, coating each of a plurality of threads with an adhesive, arranging the coated threads in trough shape, moving the threads forming one side of the trough as a layer against the threads forming the bottom of the trough, and moving the threads forming the other side of the trough as a layer against the other threads.

53. Midgley, 1,509,365. Sept. 23, 1924. Forming weftless cord fabric consists in treating separate parallel cords with a liquid material for binding a skim coat to the cords, maintaining the cords in separated parallel condition until the skim coat is applied, and applying the skim coat on and between the cords permanently to bond them in separated parallel condition.

(To be continued)

Japan's Tire Output

Industrial leaders in Japan, while expressing satisfaction with the tire production for many years of the Dunlop concern at Kobe and the progress made by the Goodrich company in Yokohama since it started to make tires last July, are nevertheless pained to note the backwardness of native enterprise in this regard. They point out that Japan's nearness to the great sources of raw rubber in the tropic Far East, its own great cotton spinning industry, and the abundance of alert low-cost labor leave no excuse for Japanese capital not undertaking tire-making on a large scale. Since nationals started operations in 1886, it is held that Japan has well shown its capacity in the manufacture of rubber goods; and during the past ten years not only has it been able to provide for most of its own rubber needs, but it has also developed an export trade of now over $8,000,000. In 1929 the export gain was 35 per cent over that of 1928, rubber footwear being the main item, with tires next, about 227,000 casings.

Yet while local production and exportation of tires continue to increase, imports of tires have also been advancing, American tires alone bought in 1929 being valued at $1,728,304. The champions of home industry are confident, however, that it will not be long before the tables are turned, and that not only will imports of tires rapidly diminish but that local production and exportation will be very considerably increased. It is intimated that plans are being considered for the early and extensive development of tire-making by native concerns as large and as well equipped, managed, and financed as some of the leaders overseas. Hence under such favorable auspices and with Japanese producers well protected with high tariff, it is argued, it will not be difficult to undersell most foreign makes of tires.

EDITORIALS

Fellow Employes' Generosity

OFFICIALS and operatives of the Akron Rubber Reclaiming Co., Barberton, O., are being widely praised for initiating and putting into effect an unusual plan for aiding fellow workers who have been laid off on account of the recent depression in which the reclaiming industry has been particularly hard hit. The entire personnel of the organization has agreed to set by five per cent of earnings each month for a fund that will provide general relief for needy company workers now lacking employment. The idea of such a fund originated solely among the active workers eager to help those less fortunate; the employed workers simply did not want their old buddies to have to ask for charity when some self-denial by the employed might spare the less lucky such humiliation.

Such practical sympathy is also taken as proof of a fine esprit de corps among the officials and operatives of the concern named that is worthy of widespread emulation; just as the relief scheme is commended to employers in every line, who, forced to dispense temporarily with the services of valued workers, and unable to keep forces intact, may thus have available many desirable employes who otherwise might drift away. Whether it be through direct company encouragement, officials' assistance, or other means, cooperation by plant managements in such humane projects as ease the distress of old, faithful workers, idle through no fault of theirs, will not only win the gratitude of the latter and greater good will in a community, but also the substantial appreciation of the purchasing public.

American Plantation Control

A COMMON, comfortable impression, even among some in the rubber industry, is that with large potential production from Liberian and Brazilian enterprises started by Americans and with excessive output likely to be continued from vast plantations operated chiefly by foreign interests in the Far East, America need worry but little about its future supply of crude rubber. But the facts scarcely justify untempered optimism.

Those great plantations, which yielded some 840,000 tons of rubber last year, two-thirds of which were taken by American manufacturers, cover about 7,000,000 acres; yet, while the United States is the major consumer and some 12,000,000 of its people depend upon industries in which rubber is essential, scarcely 3 per cent of that area is held by Americans. When it is recalled, too, that such raw material must be contracted for often six months in advance, the position of American buyers and consumers is not enviable. One need not be an alarmist even to conceive of a possible set of circumstances which in the meantime might completely shut off the rubber supply of the United States—a calamity that only a nation-wide crop failure or a total collapse in some basic industry could rival.

Even regarding such a lamentable situation as unlikely, there remains the very evident and imperative need of stabilization of price as well as supply, and from the adverse operations of such factors American manufacturers surely suffered sorely in the recent past, even to the extent of a $300,000,000 loss in a single year. Recurrence of that evil can be averted effectively in one way—through direct control by rubber consumers, preferably by purchase, of an ample area of present production; and never were conditions more favorable for obtaining rubber-growing lands. Owing to the unprecedented market weakness, plantation values have of late slumped perhaps half a billion dollars, and the prospects are that this loss will be still further augmented by the quitting of numerous small companies with meager resources. Elimination of such weak sisters and the reversion of great planted tracts to jungle might help those that can afford to remain, but to buyers it would assure neither ample supplies nor fair prices.

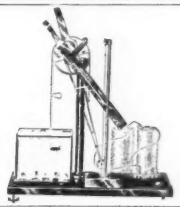
Greater consideration is, therefore, likely to be given the logical stabilization plan espoused by Edgar B. Davis of forming a combination of sufficient strength to buy or otherwise acquire on any fair basis a dominating part of the world's crude rubber production. The accomplishment of such a reasonable scheme should prove no insuperable task for American financiers. They have solved problems much more difficult, yet not more advantageous to themselves nor more beneficial to the nation.

Reclaim Preferable to Low Crude

ARTICLES are now being made wholly from new rubber that knew but little of it but a short time ago.

However, that may be justified in some cases, it does not mean that it is expedient and economical to dispense in most instances with reclaim or to use it meagerly until crude rubber gets dear again. It is contended by competent authority that there are many cases in which reclaim can still be advantageously substituted in mixes for part of the crude, even with raw rubber at an unheard-of low figure. Where it is imperative that production be quickened and output increased without raising power and labor cost, it is manifestly unwise to waste too much time and energy in working large quantities of filling materials into cheap rubber while a much more creditable article can be produced by using a larger ratio of reclaim and reducing mixing expense.

What the Rubber Chemists Are Doing



A. C. S. Rubber Division Meetings

Boston Group

THE winter series of dinner meetings of the Boston Rubber Group, A. C. S., was inaugurated by the fall meeting held October 22 at the University Club. The occasion was marked by the record attendance of 297 members and guests, who assembled to elect officers for the ensuing year and listen to the scientific program. Following the well-catered dinner, the treasurer's report was accepted as read, and the nominating committee reported the following named members for election as officers of the group for 1930-31: chairman, George H. Rockwell, Cambridge Rubber Co.; secretary-treasurer, T. M. Knowland, Boston Woven Hose & Rubber Co. By consent of the assemblage the secretary cast one vote for these nominees, who were thereupon elected unanimously.

Preceding the scientific program, Everett Morss, president, Simplex Wire & Cable Co., favored those present, at the request of the retiring chairman, John Bierer, with a brief informal account of his impressions of the principal cities of South America gained on his recently completed tour through that continent. He rated Chili and Argentina as outstanding in resources, energy and enterprise. The beautiful park systems of their leading cities and the wonderful scenery seen in the trip through the Strait of Magellan and the gorgeous city of Rio de Janeiro, the speaker said, outclass anything of the kind found elsewhere in the world.

J. J. Skelly, general manager of the Charles E. Bedaux Co., read a paper on labor control, explaining at some length the operation of the Bedaux system as applied to labor control in manufacturing establishments in all lines. The paper was illustrated by many charts showing the working of the system and the attainment of standardization in the distribution and the cost of direct and indirect labor with relation to production.

The final paper of the evening was read by Ellwood B. Spear, rubber technologist, author, and consultant, who described some practical applications of vulcanized latex. The lecturer made a distinction between cured latex and vulcanized latex and demonstrated experimentally the so-called chloroform test for distinguishing between plain, untreated latex and vulcanized latex. When chloroform is stirred into plain latex, the rubber content separates as a distinctly strong rubbery coagulum. When vulcanized latex is similarly treated the rubber content separates out as a loose non-adhering mass without strength to hold together.

Latex may be vulcanized at ordinary room temperatures when addition is made to it of sulphur, piperidine-penta-methylene-dithio-carbamate accelerator, otherwise known as "Pip-pip," and Kadox zinc oxide as activator. In practice, however, vulcanization is effected at higher temperature and under controlled conditions in order that the product obtained may be in such a balanced state that it will not age rapidly by continuation of vulcanization.

Vulcanized latex or Vultex is applied industrially: (1) for impregnation of fabrics as a preparation for subsequent processing, for water proofing, for protection against ravelling, and to increase wear resistance as, for example, in glove facings; (2) for coating cloth surfaces as on the back of pile fabrics to lock the pile securely to its backing, other examples are coated fabrics for imitation leather and coating or spraying special fibrous constructions for miniature golf greens, etc; (3) by dipping process to form such articles as surgeons' gloves, fountain pen ink sacs, toy balloons, and dipped sheet rubber. The latter is deposited continuously on the polished surface of a drum revolved in a tank of Vultex; (4) by brush painting or spray gun on the back of floor rugs to give a non-slipping grip on polished floors.

Other applications are in the experimental stage, such as adhesion of Vultex to metal, etc., are contemplated, and encouraging progress seems assured in many lines.

New York Group

THE first of the winter meetings of the New York Group, Rubber Division, A. C. S., was held in the Silver Grill, Hotel Lexington, New York, N. Y., on the evening of October 23, with an attendance of 146. Following the excellent dinner and music by the orchestra, the company was entertained by Fred C. Batchellor, who told several amusing stories in French-Canadian dialect. After a few words of greeting and invitation by John M. Bierer, retiring chairman of the Boston Group, the meeting was devoted to a program of two technical papers, the first by H. G. Bimmerman, of E. I. du Pont de Nemours & Co.'s rubber laboratory, on "Control of Uniformity of Press Cures."

This paper covered several years of laboratory experience with different methods of piping, various control instruments, methods of determining platen temperatures, etc. The author stressed the importance of the source and quality of the steam supply, recommending that the leads to the presses be taken from the top of the steam line and feed the press upward from the lower platen. The exhaust manifold should be located at a level below the platens. Each platen should be drained or bled from its lowest point. Heat insulation of the press is most important.

Particular stress was laid on preventing loss of heat by the use of several plies of asbestos paper placed between the lower bolster of the press and the top of the ram. The top of the press and the edges of the platens must be well covered by asbestos insulation, and the platen section shielded to prevent access of air drafts. As between piping the press platens in parallel or in series, the author recommended parallel piping and the use of a simple steam separator in the supply line to eliminate water.

The location of the sensitive elements of the temperature control system is particularly important. The preferred location of the bulbs in the cross or tee at the intake manifold and at its drainage point is preferred to their location in the main supply line. The temperature type of control is more accurate than the pressure type. The methods of temperature control recommended by the Physical Testing Committee are satisfactory. These methods employ thermocouples and bulbs located in the mold body. The former are good for detecting cool spots but are not so convenient as mercury bulb thermometers. Multiple platen presses require constant care and attention to keep the platens of uniform temperature; while single opening presses are regulated with much less difficulty.

This paper was discussed from a practical engineering standpoint by Paul Lupke, and by John Ball, who emphasized the desirability of elaborating on the merits of the control equipment and suggested that study of the matter of press control be commended officially to the Physical Testing Committee. The secretary of the New York Group was directed by the chairman to do so.

The second paper presented by Harlan A. Depew, Research Dept., New Jersey Zinc Co., Palmerton, N. J., was entitled "Accelerated Discoloration Tests for White Rubber Products and Methods of Measuring the Extent of the Discoloration."

This paper reports a study relating to the features of brightness and saturation of zinc oxide and lithopone compounded in rubber influenced by the ultra violet rays of sunlight. Laboratory and weather exposures to heat, freezing, and rains were conducted. The mercury and carbon arc exposures were used for accelerating the discoloration, and a formula was deduced for giving numerical expression to the effect.

In discussing this paper, Frank G. Breyer

said that the investigation should be extended to include titanium oxide, most brilliant of all white rubber compounding pigments, zinc sulphide, and possibly a white of very low covering power such as whiting, etc. The problem is not peculiar to the rubber industry. It is of interest in connection with paints and enamels and in the glass industry particularly because of the need to protect the interposed flexible ply used in preventing non-shatterable glass from yellowing by action of ultraviolet rays of sunlight.

The available methods for preventing such discoloration are in the order of their importance: (1) the addition of some material that will stop the entrance of ultraviolet rays by blooming to the surface as a protecting coating, (2) incorporation in the stock of a material absorptive to ultra violet waves, and (3) pigmentation.

The meeting closed with a most entertaining and instructive account by A. A. Somerville of his experiences during the ten-day trip to Russia that he made last June. He entered the country by railway through the double barbed wire barrier along the Russian-Latvian boundary, which is guarded on both sides by troops of the respective countries. The details of entering Russia are time consuming and include making inventory of all items of one's personal effects, wearing apparel, jewelry, and money as a protection against the removal of anything not so listed when the visitor leaves the country.

The Russian rubber industry is centered mostly on the production of boots and shoes. Tires are a very minor item because of the small need for them owing to the nearly complete absence of automobiles. In his return from Russia our traveler flew from Leningrad to Berlin by stages in airplanes, beginning with a one-passenger plane and ending at the Templehoff field in a 22-passenger cabin plane.

The talk was so absorbingly interesting that the audience would have remained longer; but the hour for adjournment approached, and all took leave voting the meeting a great success.

Chicago Group

THE Chicago Rubber Group held its first meeting of the 1930-1931 season on Friday, October 3, in the Auditorium Hotel, Chicago, Ill. Paul Van Cleef, president of the Chicago Chemists Club, gave an informal talk on his recent visit to the German Rubber conference at Frankfort, Germany, following which a paper on liquid latex was presented by M. C. Teague, sales manager of Dispersions, Inc. Numerous samples of material treated with liquid latex were exhibited and the process of their treatment described, demonstrating that the use of rubber today is not confined to the ordinary mechanical goods and tires as in the past, but that rubber can be used now in practically every industry.

The discussions following the paper lasted an hour and a half and was exceptionally active and interesting.

The meeting was indeed a success, not only from the standpoint of attendance but from the interest displayed by those present.

Los Angeles Group

LOS ANGELES Group, Rubber Division, A. C. S., held a joint session with Southern California Section, A. C. S., at the Engineers' Club, Los Angeles, Calif., at 6:30 p. m., on October 3, and was warmly complimented on the interesting program which it provided. After the dinner, which was attended by 150, Dr. David Spence, technical director of American Rubber Producers, Inc., gave an address on the production of rubber from the guayule plant, illustrated with moving pictures showing operations at Torreon, Mexico, and Salinas, Calif. He also answered numerous questions. President F. W. Stavely, of the Rubber Division, named Messrs. Pond, Holmes, and Drew as a nominating committee to report at the annual meeting in December.

Akron Group

THE fall meeting of the Akron Group, Rubber Division, A. C. S., was held Monday evening, October 27, at the Goodyear Auditorium. After a Boston-baked-bean repast the group listened to a most interesting lecture by Prof. F. E. Lloyd, of McGill University, Montreal, on "Sources and Cultivation of Rubber." This talk was illustrated by pictures taken personally by the author, who is an explorer and authority in botany.

Professor Lloyd is well known for his work and publications on guayule and its success as a commercial source of crude rubber. He has contributed many botanical articles to scientific publications not only on guayule but on a large number of other plants.

As this meeting occurred too late in the month, a detailed report, necessarily deferred, will appear in the December issue of this journal when a full account will be given.

Total Sulphur in Rubber[1]

J. G. Mackay[2]

THE term "total sulphur" is used generally in rubber practice to denote the total amount of elemental sulphur added to effect vulcanization, and in this sense it is a value of great importance. In this paper the term will be used to include all sulphur present in the mixing, whether added originally in the elemental state or as a compound containing sulphur, with the sole exception of sulphur added as barium sulphate.

In the laboratories of many rubber factories total sulphur is at present determined by the Carius method. This method gives results of dependable accuracy but is far too tedious for routine purposes, and many attempts have therefore been made to devise a method of greater rapidity but still comparable in accuracy with the Carius method.

Method of Analysis

The following method for the determination of total sulphur in rubber was evolved by the author after extended research. The new method involves oxidation by means of nitric and perchloric acids and bromine, followed by volumetric determination as benzidine sulphate of the sulphuric acid produced.

Into a Kjeldahl flask of 300 c.c. capacity are introduced 10 c.c. of fuming nitric acid (density 1.50), 5 c.c. of perchloric acid (density 1.54), and 0.5 c.c. of bromine. Approximately 0.25 g. of soft rubber or 0.15 g. of vulcanite is weighed out in a small glass tube of known weight, and the tube and its contents are slid gently down the neck of the flask into the oxidizing mixture. A small water condenser is now inserted into the neck of the flask. It is then gently warmed to start the oxidation, which thereafter proceeds spontaneously. If a small flame be kept under the flask for half an hour or so, the nitration will be completed and a yellow solution of nitrorubber will remain, in which are floating globules of free sulphur.

When the removal of nitric acid is almost complete, the atmosphere within the flask clears and the boiling mass darkens rapidly. Thereafter the evolution of gas becomes more violent and the flame is taken away. The contents of the flask then becomes clear and in a few minutes are practically colorless. If the liquid does not clear during the heating, it is necessary after cooling to add 1 to 2 c.c. of perchloric acid and heat again to boiling, when the liquid immediately loses color.

The contents of the flask and rinsings are then transferred to an evaporating basin, 2 g. of pure sodium chloride are stirred in, and the whole is brought to dryness on the steam-bath; 10 c.c. of concentrated hydrochloric acid are then added and the liquid is again taken to dryness. The residue is moistened with 2-3 c.c. of dilute hydrochloric acid (*2N*), taken up with hot distilled water, filtered, diluted to about 250 c.c., and heated to boiling. The sulphate is then precipitated by 50 c.c. of a boiling solution of barium chloride (*0·2N*), added all at once, and with constant stirring. The mixture is set aside on the hot plate for 30 min., and filtered hot through a double filter paper. The precipitate is washed with hot water until the washings are free from chloride, dried, and ignited. The precipitate is then treated with a drop of concentrated sulphuric acid and a few drops of alcohol, dried, and ignited to constant weight. It is necessary to deduct the weight of barium sulphate obtained in a "blank" determination from the weight of the precipitate.

When total sulphur has to be determined in a mixing containing lead, it is necessary to determine the amount of lead sulphate formed during the oxidation by the procedure devised in these laboratories by Neil T. Hay; this involves determination of the loss in weight produced in the residue after oxidation by washing with a boiling solution of ammonium acetate.

Ferric ions interfere with the gravimetric determination of sulphate. In this case it is advisable, after evaporation with hydrochloric acid, to remove the iron as ferric hydroxide and precipitate barium sulphate in the filtrate after boiling off excess of ammonia. Some sulphate will be absorbed by the flocculent precipitate of ferric hydroxide; this can be included in the de-

[1] *J. Soc. Chem. Ind.*, May 23, 1930, 233T-41T; Oct. 10, 1930, 401T-03T.

[2] Chemist, Castle Mills, Edinburgh, Scotland.

termination by dissolving the precipitate in hydrochloric acid, and precipitating again with ammonia; this second filtrate is then added to the main bulk for the determination of sulphate.

In the analysis of mixings containing antimony low results are often obtained because of the considerable excess of hydrochloric acid which must be added to prevent separation of antimony oxychloride. It is advisable, therefore, to add, prior to precipitation of barium sulphate, a sufficient volume of a saturated solution of sodium potassium tartrate to keep the antimony in solution.

It is still possible to complete a determination in duplicate in 4 hrs., and as a routine procedure the method has given complete satisfaction.

Insolubility of Pigmented Rubber

IN A paper published a short time ago[1] the author showed that the solubility of pigmented rubber in benzene can be changed by altering the interfacial energy between the rubber and the pigment, and this can be accomplished either by changing the surface of the pigment or by changing the nature of the rubber—as, for example, by treating zinc oxide with sulphur trioxide gas and by adding organic acid to rubber.

The following theory is offered by the author to explain the insolubility of pigmented rubber:

One explanation of the insolubility is that the pigments are in a flocculated state in the unvulcanized rubber, and the flocculent structure acts as a semi-permeable membrane which prevents the rubber aggregates from passing through. The common rubber solvents are known to be strong flocculating agents for pigments, and they would tend to keep the pigment in its flocculated state. The flocculated pigment particles, each surrounded by rubber except at the point of contact, make threads and sheets which run irregularly throughout the compound and intermesh in every direction making a network of pigment so that it would be conceivable for an electron, as an example, to move from any part of the compound to any other part along the chain of pigment particles without leaving pigment.

The addition of stearic acid breaks down the flocculated pigment structure—and thereby destroys the semi-permeable membrane and increases the solubility. The very considerable increase in softness due to the addition of the stearic acid is in itself impressive evidence that a flocculated structure has been destroyed.

When a pigment is spoken of as dispersed or flocculated, it does not mean that all the particles are dispersed or all flocculated. It is quite likely that in every mix containing pigments there are aggregates, unmixed pigment, dispersed pigment, and flocculates. The expression "flocculated" means that a large enough percentage of the particles is in this state to give the rubber properties, such as stiffness and insolubility, that are characteristic of flocculated pigment.

When pigments are milled into rubber, they are usually incorporated in small groups; then the mixing action breaks up the groups of pigment particles and coats the individual particles with rubber. If the wetting of the pigment by the rubber is poor, the individual particles will stick together when they come into contact; and they will then be spoken of as flocculated.

[1] "Influence of Pigments on Some Physical Properties of Unvulcanized Rubber." By Harlan A. Depew, *Ind. Eng. Chem.*, Nov., 1929, pp. 1027-30.

American Rubber Technologists

Elmer G. Croakman, chem. *b.* Feb. 2, 1898, Buffalo, N. Y; Buffalo U., 1918; research chemist on dyes, intermediates, accelerators, and rubber colors, National Aniline & Chemical Co., Buffalo, N. Y., 1918-26; research chemist, Philadelphia Rubber Works Co., Akron, O., 1926 to Feb., 1930; technical sales director, Saylor Silica Co., Butler, Pa., since Feb., 1930. *Author:* Papers on technology of reclaims (with H. A. Winkelmann) and patents on dyeing rubber and D. P. G. accelerator. *Member:* A. C. S. *Address:* 105 Casterton Ave., Akron, O.

Philip Endicott Young, engr. *b.* Dec. 1, 1885, Dorchester, Mass.; B. S. (mechanical engineering) M. I. T., 1909; night supt., Goodyear T. & R. Co., Akron O., 1910; with Acushnet Process Co., New Bedford, Mass., since 1910, holding successively the following positions, vice pres., sales mgr., gen. mgr., and since 1920 pres. and treas. *Author:* Patents on Four Roll Washer, Young's Gravitometer, and specific gravity slide rule. *Member:* Board of directors First National Bank, New Bedford, Mass., Delta Kappa Epsilon. *Address:* Acushnet Process Co., New Bedford, Mass.

Paul Frederick Shaver, chem. *b.* Sept. 6, 1903, Logansport, Ind.; B. S., Purdue U., 1925; Merchandise Dist. Dept. Production Control, Goodyear T. & R. Co., Akron, O., 1925-26; factory control chem., Trump Bros. Rubber Co., Akron, 1926-27; chf. chem., Rubber Recovery Co., Akron, since 1927. *Author:* "Deterioration of Gas Mask Facepiece Rubber." *Member:* 2nd Lt., Chem. Warfare Service—Reserves. *Address:* 1132 Laird St., Akron, O.

Alfred James Northam, chem. engr. *b.* Dec. 26, 1899, Accomac, Va.; B. S., U. of Md., 1922; chem., R. I. State College Exper. Station, Sept. 1922-Feb. 1923; National India Rubber Co., Bristol, R. I., Feb. 1923-May 1924; Pennsylvania Rubber Co., Jeannette, Pa., May, 1924-May 1927; Grasselli Chem. Co., Cleveland, O., May, 1927-Apr., 1929; E. I. du Pont de Nemours & Co., Wilmington, Del., since Apr., 1929. *Member:* A. C. S., Mason, Theta Chi. *Address:* 622 Geddes St., Wilmington, Del.

Ernest B. Curtis, chem. *b.* Martinsville, Ind., Apr. 14, 1890; U. of Ind., A. B., 1912, A. M., 1913; student worker, U. S. Rubber Co. factories, 1913-1915; research and development work, 1915-1919, asst. director, 1920-1925, General Laboratories, U. S. Rubber Co., New York, N. Y.; sales mgr., Naugatuck Chemical Co., New York, N. Y., 1925-1929; vice president, Naugatuck Chemical Co. and Rubber Regenerating Co., since 1930. *Member:* Mason, Am. Chem. Soc., Alpha Chi Sigma, Dunwoodie Golf Club. *Address:* 1790 Broadway, New York, N. Y.

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Technical Communications

Non-Discoloring Antioxidants

THE age resisters, Antox, Zalba, and Parazone, were compared in a base stock for a high grade pastel colored hot water bottle, applying the oven and the oxygen bomb tests and using di-ortho-tolylguanidine as accelerator. The reference compound containing no antioxidant fell below 1,000 pounds per square inch tensile strength after 14 days' aging in the oven, and the test was therefore discontinued at that point.

Oven tests on Parazone and Zalba were also discontinued at the end of 14 days, but the test on Antox was continued through 21 days because it showed very little deterioration at the end of the fourteenth day. Summarizing the oven tests, Antox is the most effective preventive of heat deterioration. Parazone and Zalba improve the oven aging but to a lesser extent than Antox.

It is not feasible to use Antox in many very light colored rubber compounds because stocks containing it discolor when exposed to sunlight. The discoloration is, however, a great deal less than that caused by Neozone D (phenyl-beta-napthylamine). The principal use for Antox is in red tubes and colored footwear stocks.

Zalba is recommended for compounds whose color is such that Antox cannot be used satisfactorily. Although Zalba has relatively little discoloring effect, it should be used with caution in white or very light colored compounds that are to be exposed to sunlight for long periods of time, since under such conditions it does cause a distinct discoloration.

Parazone is a strictly non-discolorizing antioxidant and may be used in any type of stock regardless of the extent to which it may be exposed to sunlight. Although Parazone is less effective than either Antox or Zalba, the hot water bottle containing Parazone aged twice as well as the one containing no antioxidant. Parazone should be used with caution in colored compounds since it has a tendency to bloom to the surface if more than about 0.5 percent is used based on the rubber content. The bloom is white and therefore not objectionable in the case of white stocks.

The following table summarizes the physical properties of these antioxidants.

	Antox	Zalba	Parazone
Physical form	Amber liquid	White powder	White powder
Specific gravity	1.01	1.15	1.20
Discoloring effect	Distinct	Slight	None
Effect on rate of cure	Accelerates. Activates acidic accelerators such as Thionex and Captax.	Accelerates but activates Captax and Thionex only very slightly	No effect or very slight retardation

Data from E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Dustless Micronex

THE production of dustless Micronex is a triumph in physical chemistry and of great economic significance to the rubber industry, particularly to hundreds of small manufacturers in whose mill rooms colored and black stocks must be mixed.

Dustless Micronex is being produced by patented process in a newly established unit. Its form is small pellets the size of bird shot. These have a porous structure readily seen under low power magnification. This structure is the secret of the dispersability of the material and differentiates it from any superficially similar product obtained by letting down carbon black in a liquid with subsequent evaporation. The latter procedure results in a dry, harsh, hard, and relatively non-friable aggregate.

Dustless Micronex was developed to eliminate the nuisance of carbon black flying everywhere in the mill room and vitiating the colors of other mixings. In this respect alone its use will result in economy of untold value. Incidentally, too, the loss will be stopped of the 5 per cent of carbon black dust experienced now in the average rubber factory.

In regard to weighing out for batches dustless Micronex is much easier to handle than the ordinary form. The smooth pellets flow readily and can be handled in any amount with an ordinary scoop with little or no flying. Data from Binney & Smith Co., 41 E. 42nd St., New York, N.Y.

Switchboard Mat Tests

A SAFETY tread mat for light and power switchboard service must be thoroughly dependable as to dielectric strength and aging quality in order to be approved by the Bureau of Safety of Chicago. A 3-ply Melflex safety tread rubber mat showed the following highly satisfactory dielectric and aging tests.

The dielectric strength test was made by filling a section of the corrugated upper side of the mat about 3 inches square with lead foil and placing a metal plate of the same area under the mat directly beneath the upper electrode. The voltage was applied to the lead foil, and the metal plate was grounded. The dielectric strength results were on first trial 71,700 volts and on the second trial 73,400 volts. Flash-over through the previous points of breakdown prevented additional trials.

Before aging, samples of the rubber composition from the middle layer of the mat tested 2,420 pounds per square inch tensile strength and 650 per cent elongation at break. Samples from the bottom layer tested before aging, 715 pounds per square inch tensile strength and 175 per cent elongation at break.

After Geer oven aging equivalent to 2 years the corresponding values of the middle layer samples were reduced to 1,075 pounds tensile and 520 per cent elongation, and bottom layer samples to 500 pounds tensile and 95 per cent elongation.

In service the middle pure gum layer would age less rapidly than in the test reported because of its protection by the upper and lower layers. The dielectric strength results indicate good insulating value. Data from Melflex Products Co., Akron, O.

Rubber Aluminum Paint

A NEW development in aluminum paint results from compounding the finest grades of aluminum powder with scientifically compounded liquid rubber as a vehicle. It may be used for coating any surface, including galvanized metal, will adhere to concrete without cracking or peeling, and is unexcelled for all "hot spots." This ready-mixed paint can be applied by brush or gun. The endurance of this paint when used on hot surfaces, is exemplified by the following examples. On the exhaust manifold of automobiles it has kept in good condition for more than four months. On a two-burner electric stove in the laboratory it is still in good condition after two months' daily use.

The coverage is greater than that of other paints. One gallon provided two coats for a smoke stack of 500 square feet area, and enough remained to paint the guy wires, with some dilution.

Owing to its highly resistant quality to heat this paint can be used on steam traps, steam lines, boiler fronts, stacks, gasometers, oil tanks, and on many other industrial structures. Data from Willard Rubber Co., Ltd., 2320 Newton Ave., San Diego, Calif.

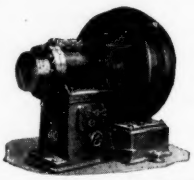
Hard Rubber Sheet, Rod, and Tubing

THE physical properties of hard rubber sheet, rod, and tubing vary according to the compound, dimensions, and purpose for which they are developed. Hard rubber sheet of finest quality can be made to vary in accordance with the following data:

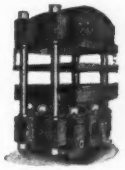
Tensile strength	up to 9,500 lbs. per sq. in.
Elongation	2 to 40 per cent
Hardness, Shore Scleroscope	40 to 70
Specific gravity	1.16 to 1.40

Softening point varies between 175 to 200° F.
Thermal coefficient varies between .000045- and .00008-inch per degree C.

In general, the better the grade of hard rubber, the higher the tensile strength, the greater the hardness, and the lower the specific gravity. Data from the American Hard Rubber Co., 11 Mercer St., New York, N. Y.

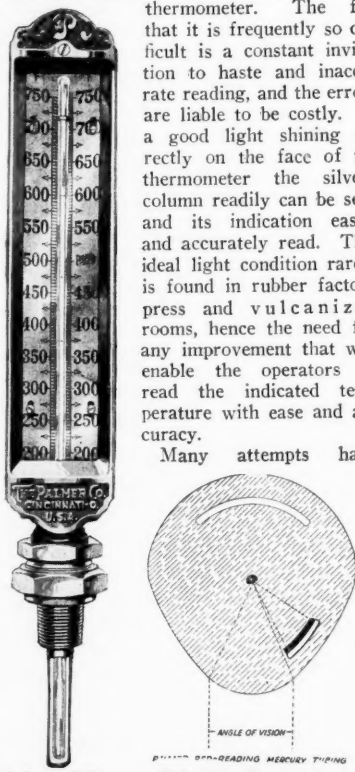


New Machines and Appliances



Red Reading Thermometer

EVERY rubber man concerned with observing temperatures has experienced the difficulty at times to see and read the silvery column of the ordinary industrial thermometer. The fact that it is frequently so difficult is a constant invitation to haste and inaccurate reading, and the errors are liable to be costly. In a good light shining directly on the face of the thermometer the silvery column readily can be seen and its indication easily and accurately read. This ideal light condition rarely is found in rubber factory press and vulcanizer rooms, hence the need for any improvement that will enable the operators to read the indicated temperature with ease and accuracy.



Industrial Type Reflecting Construction

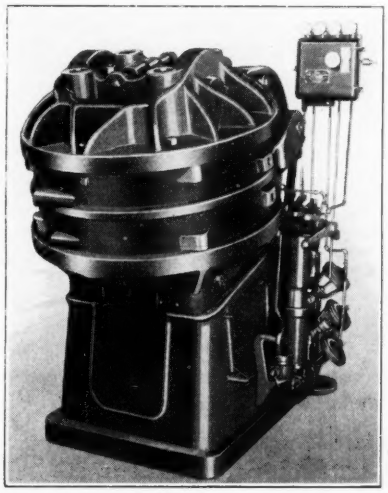
Palmer Red Reading Mercury Thermometer

Many attempts have been made to produce a contrasting effect which would aid the user in distinguishing the top of the mercury column, and many chemical mixtures have been devised which produce a red or other color in the reading column of a thermometer tube; but none of these liquids have supplanted the use of pure clean mercury. In the new red reading thermometer here pictured the mercury column shows bright red instead of the regular silver appearance.

Mercury is a natural mirror so that by placing a strip of red or colored glass to the side of the bore or reading column and by having this bore turned to a slant, the red glass is reflected by the mercury column. Thus when viewed through the lens in front of the tube, only the red color is seen. The idea is new, basic, and novel. The construction of the glass is shown by the sectional view. The mercury is not disturbed or harmed by any chemical to change its color, and the effect is that of reading a bright red column of pure mercury. The Palmer Co., St. Bernard, Cincinnati, O.

Unit Tire Vulcanizer

THE substitution of unit vulcanizers for curing tires in place of the usual pot heaters has many advantages. In the past few years vulcanizers of this type have combined satisfactory performance with good mechanical engineering. The one here illustrated is exceptional in that respect. It has passed many critical tests and shown perfect vulcanization and striking operating economies. This vulcanizer is entitled to full credit for producing more uniform product and lower curing costs, at substantially lower investment in tire mold equipment.



De Mattia Unit Tire Vulcanizer

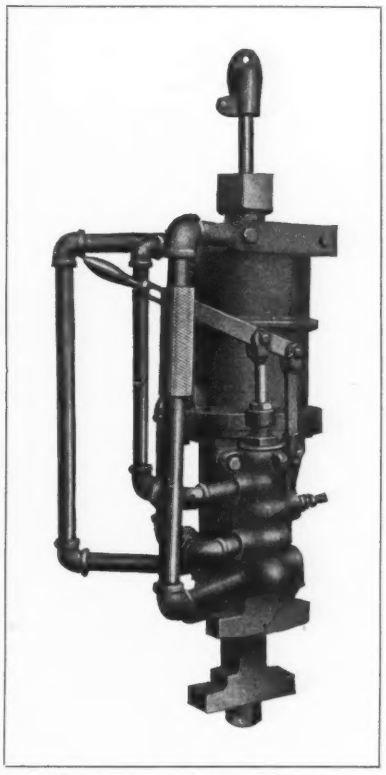
It is available for passenger car, airplane, truck and bus pneumatics. Even the smaller units are built to withstand 300,000 pounds' pressure between platens allowing the use of 300 pounds' pressure without producing rinds on the tire. Blemishes are eliminated because the raw tire does not contact with the hot mold until the press is closed. One man can operate as many as 80 units curing 4.75 by 19-inch tires. The cure is 55 minutes, change time 30 seconds per tire, allowing the operator a 15-minute rest period between rounds. This efficiency is due to the special feature of self-acting rimming and stripping of the tire and automatic control with an average time not exceeding one minute. The vulcanizers are operated with 300 pounds' hydraulic pressure and are locked by a toggle mechanism so that hydraulic pressure is not required to hold the presses closed. There is no chance for the press to open while the tire is curing. Likewise precaution has been taken to prevent the vulcanizer from opening until the internal pressure has been fully released. Attention has been given to lubrication, etc., and as a result maintenance cost is nil. National Rubber Machinery Co., Akron, O.

Tire Mold Breaker

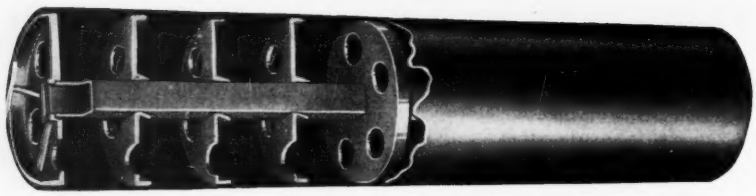
THE work of separating tire molds is particularly strenuous and expensive when accomplished by hand labor with crow-bars. The sturdy machine here pictured is very efficient for this work. By its use one man can do the work of two.

The mold breaker, as it is called, is movably suspended over the molds and is operated by placing the jaws at the bottom under the mold lugs. By application of hydraulic power the parts of the mold are separated.

The machine is of heavy construction with bronze cylinder and is operated by a Critchlow valve. Standard equipment consists of one machine, one turnbuckle, and



Akron Standard Mold Breaker



The National Sherardizing Co.'s Large Diameter Light Weight Shell

one spring. The spring is used to allow slight variation in the position of the mold breaker so that it will take large and small molds having a different height from the conveyer. The maintenance of this breaker is practically nil. The Akron Standard Mold Co., Akron, O.

A New Stock Shell

STOCK shells of larger diameter are in steadily increasing demand in the rubber industry. The design, construction and features of weight and strength of such shells require special consideration.

In the shell illustrated herewith these two elements are especially featured to render it less liable to damage in handling. Thus a rigid, seamless, steel, square bar of heavy gage is used to resist twisting by the bar that turns the shell in service.

Another improvement is the interlocking of the inside spider to the liner as well as the body. This is accomplished by complete acetylene welding. The spiders are welded to the square tubing. Then the body is strapped and drawn tight, and spiders and body welded together, thus making it impossible for any part to become loose. The spiders are made from 14-gage pressed steel stock. As the diameters of the shells increase, the gage of the sheet plate or outside body is increased correspondingly.

Shells of this improved construction are also used for building drums perfectly smooth and true in alinement. The National Sherardizing and Machine Co., Hartford, Conn.

Belting Duck Slitter

IN SLITTING frictioned duck for belt making it is desirable to have for the work a machine that is fitted to receive the duck on rolls in liners and be capable of slitting it into widths of uniformly precise measure. Following this operation the slit goods should be wound neatly in rolls with narrow liners for delivery to the belt making machines.

The machine here pictured is designed especially for this service. The slitting operation gives clean-cut frayless edges, and provision is made for winding the slit sections into rolls in one operation, usually with a liner or separator cloth fed into the rolls to prevent adhesion of the duck. This calls for liner feed apparatus and also for apparatus for removing the original separator cloth in the mill roll prior to slitting the duck and for rewinding this cloth into rolls for repeated use.

The slitting is done by the pressure method known as score cutting, and the method of winding is the surface-wind type. The rolls of slit stock are built up on the surface of two sets of supporting drums alternately, to avoid contact with the rolls of adjoining strips. The machine is built in 62-, 72-, and 82-inch widths and produces rolls not exceeding 36 inches in diameter at a speed of 150 to 300 feet per minute.

In the illustration the mill roll of fabric in liner to be cut is seen at the extreme left. The liner from this roll is led under the cutting machine and rerolled in the wind-up stand at the right. Alternate strips of slit stock are wound on shells adjusted on two floating shafts. Liners are fed into these individual rolls from spools at the top of the machine as shown. Cameron Machine Co., 61 Poplar St., Brooklyn, N. Y.

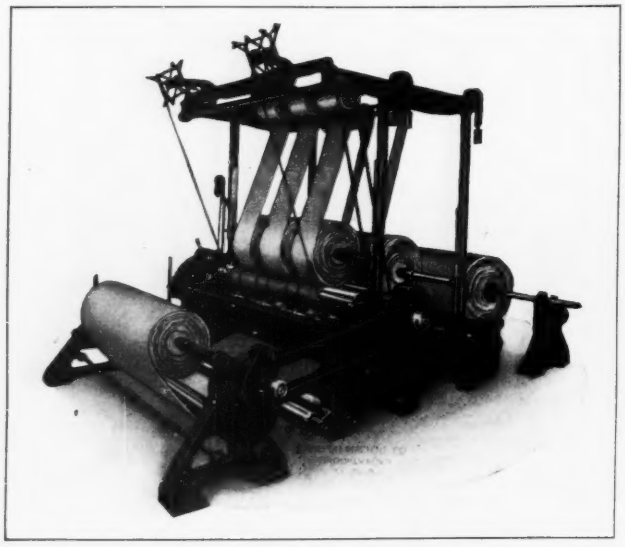
Colloid Mill

A MACHINE with the characteristics of the colloid mill here illustrated becomes a virtual necessity for preparing the ingredients for latex compounding as well as to effect the finished compounding. This mill is the outcome of extensive laboratory and engineering research and development, together with seven years of service in industry. The machine is a high-speed dispersion type mill in which liquids, semi-liquids, and liquids carrying solids in suspension are passed through two related surfaces, one stationary and the other rotating at high speed.

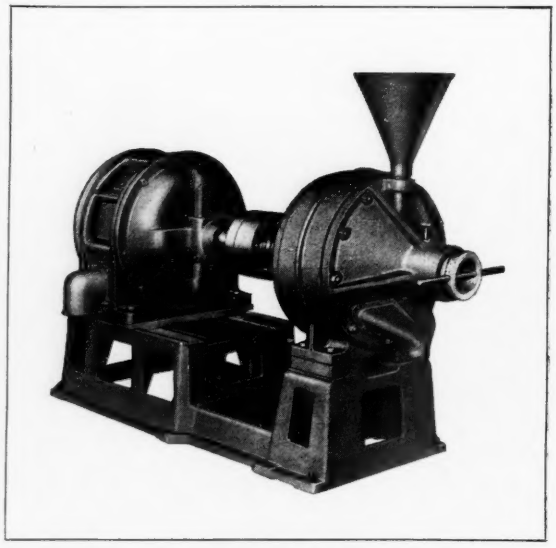
The operating principle consists of a hydraulic shearing action in which the particles are not rubbed between two surfaces as in ordinary grinding but are dispersed by adhesion of the material to the rotor and the stator. The high speed of the rotor and the passing of the material between very fine clearances bring about a lamination and shearing of the particles resulting in a complete and speedy dispersion.

The construction is extremely simple. Two flat end plates together with a cylindrical jacketed stator form the housing for the rotor, which is mounted on a horizontal shaft. Removal of these end plates, accomplished very quickly, exposes all parts for inspection and cleaning.

The grinding surfaces of stator and rotor are parallel but are at a slight angle with reference to the shaft. The gap may be varied with .004- to .024-inch on Model 00, and .004- to .034-inch on model No. 1, by moving the rotor shaft lengthways. Speed and quality of processing may be changed by increase or decrease of this gap, also by varying the head of liquid fed to the mill. The J. H. Day Co., Cincinnati, O.



Camachine Slitter and Roll Winder



Hurrell Colloid Mill

Abrasion Testing Machine

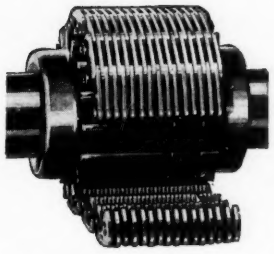
THE accompanying illustration represents the improved form of an abrasion machine devised at the Bureau of Standards and described by P. A. Sigler and W. L. Holt in a technical paper published in the INDIA RUBBER WORLD on August 1, 1930.

The machinery, which is now available as laboratory testing equipment, is mounted upon a cast iron base plate as a self-contained unit with a ¼-h.p. induction motor of the fully enclosed ventilated repulsion type. It is provided with a Boston gear speed reduction unit fitted with Timken roller bearings giving a reduction of 40 to 1.

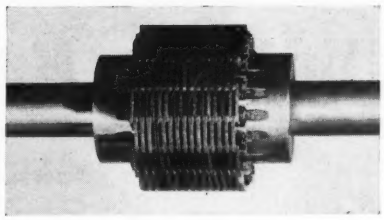
The abraider consists essentially of a rubber coated metal drum, which is rotated at 40 r.p.m., the revolutions being indicated by a counter attached to one end of the shaft. Three aluminum arms each hinged at one end, can be lowered over the abrasion drum. A weight is suspended on the free end of each arm to exert a downward force of 5 pounds directly upon the test piece attached to the under side of the arm.

Three dial gages graduated in thousandths of an inch are fastened to a bridge so that each contacts with the corresponding arm at a point directly over the test piece. This bridge is hinged at one end to allow the gages to be swung out of the way when desired as well as to allow the arms to be swung back for the placing of samples on them. An abrasive consisting preferably of No. 2½ garnet paper or cloth 6 inches wide is held on the rubber covered drum by four rubber bands. A compressed air line is used for keeping the abrasive surface clean.

In making a test the samples are first allowed to wear until the surface conforms to the shape of the abrasive surface drum. The machine is then stopped, the gage bridge locked in place, and all gages and the counter set at zero. The machine is then run until about 0.1-inch has been abraded from the surface when the machine is stopped and the counter and gage readings recorded. From these readings the revolutions per 0.1-inch wear are calculated. Morehouse Machine Co., 233 W. Market St., York, Pa.



Method of Wrapping Chain Around Pinions



Complete Assembly Without Metal Case

Morse Flexible Couplings

Flexible Coupling

ONE of the greatest advantages of the Morse flexible coupling is simplicity, as it comprises only three principal parts—two sprockets encircled by a Morse silent chain. The guide groove in one sprocket holds the chain in place while the other sprocket is free to float under the chain. This relieves the adjacent shaft bearings of possible thrust strains by permitting free end play. In addition the flexibility of the chain relieves the coupling pinions of a great deal of the shock that accompanies starting and consequently reduces excessive wear on the coupling parts to a great extent.

Every factory maintenance man knows the difficulty of placing shafting in perfect alinement. Many factors such as worn bearings, the settling of factory buildings, etc., may effect the performance of the whole job. A Morse flexible coupling between the source of power and the point of use will often compensate for such faults. While these couplings are not intended to correct careless installation or worn out equipment, they do stop vibration due to shaft misalinement. For unusual tortional flexibility a spring socket can be easily incorporated into the design of the coupling.

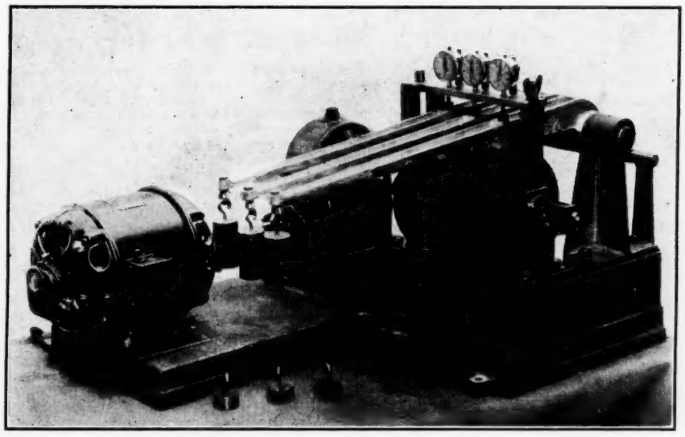
These couplings are exceptionally easy to uncouple simply by removing a pin from the chain. Both spun metal revolving cases and stationary sheet metal cases are furnished, depending upon the nature of the installation. The manufacturer will give further particulars on request. Morse Chain Co., Ithaca, N. Y.

Cement Stock Cutter

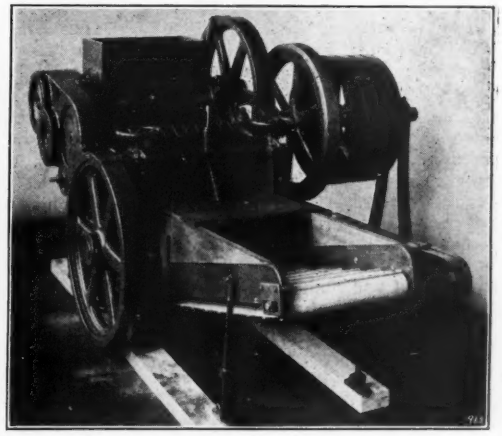
THE manufacture of rubber cement by churning in a solvent is greatly facilitated by supplying the cement stock compound in small pieces. For this purpose the machine here illustrated was specially designed. It is a rugged unit in which the best materials and workmanship are combined in an excellent design. In operation, compounded raw rubber sheet stock is fed into the series of rotary shears, which slit or cut the material into strips. These are immediately conveyed on an apron to spiral knives, which work against a stationary knife bed of high speed steel. In this arrangement of knives the strip stock is cross-cut into suitably small pieces for addition to the solvent in the churn.

The cutting surfaces of the rotary shears are hardened with provision for adjustment. The spiral knives are self-sharpening and adjustable with relation to the bed knife. The machine drive can be right or left either by belt from a line shaft or by motor using flexible power connections. The bearings of this machine are equipped with Zerk fittings conveniently located for lubricating.

All gears employed in its construction are machine cut and well guarded. The unit will be found dependable for the work of preparing compositions of all grades for rapid reduction to cement form. Makers of cement in large volume such as proofers, footwear manufacturers, and cement makers for the trade will profit by using this equipment. Black Rock Mfg. Co., Bridgeport, Conn.



Bureau of Standards' Rubber Abrasion Tester



Perkins Rubber Cement Stock Cutter

Editor's Book Table

New Publications

"Periodic Review." Metallgesellschaft Frankfort-on-Main, Germany. Issue No. 4, August, 1930, (English) contains a full detailed illustrated account of the extensive research laboratories of the Metallgesellschaft. In the colloid chemical laboratory is a testing room equipped with the necessary physical testing equipment such as a Schopper tensile testing machine for rubber, textiles, and paper, an abrasion machine, a machine for testing elasticity, etc., also a vault, suitably protected, for accelerated aging of rubber under high oxygen pressure.

"Non-Blooming Antioxidants." Laboratory Report No. 149. E. I. duPont de Nemours & Co., Inc., Wilmington, Del. This is devoted to comparison of Antox, Zalba, and Parazone antioxidants in high grade pastel colored hot water bottle stock.

"The Budding of Rubber." The Rubber Research Scheme (Ceylon) Imperial Institute, South Kensington, London, S. W. 7, England. In this pamphlet all the working details as to tools and methods are given for bud grafting rubber trees and their care.

"Neville Chemical Handbook—Resins, Solvents, Coal By-Products." Neville Chemical Co., Pittsburgh, Pa. This loose-leaf binder book includes general information on Neville resins and data on their use in the varnish industry. Complete specifications on solvents and miscellaneous coal by-products for industrial purposes also appear.

"Yarway Blow-Off Valves." Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pa. This very attractive 40-page booklet contains a comprehensive exposition of modern blow-down practice and equipment and covers the complete Yarway line of both seatless and double-tightening valves for all requirements. It is complete in engineering data, operating instructions, etc., and is generously illustrated with photographs, sectional views, and diagrams. It is cross indexed for easy reference and will serve as a practical text book of real usefulness to any rubber plant operator.

"Effect of Accelerators on Plasticity and Rate of Set-up of Uncured Stocks." E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Laboratory Report No. 150. This report compares Accelerator 808, Di-ortho-tolyguanidine, Urika, and Thionex, the latter accelerator being tested both in the presence and absence of litharge.

"Fifth Annual Report, 1930." The Rubber Exchange of New York, Inc. This report upon the administration and the activities of the Exchange from September 1, 1929, to August 31, 1930, by F. R. Henderson, retiring president, is supplemented by the financial report of the treasurer, J. C. Cuppia, to which is appended the certified balance sheet of accounts.

"Morris Automatic Trimming Machines for the Rubber Trade." T. W. Morris, 6312 Winthrop St., Chicago, Ill. This catalog of trimming machines for molded rubber goods contains a comprehensive exposition of trimmers, showing by pictures and text their adaptation by manifold attachments to trimming various sizes and types of goods.

Book Reviews

"Chemical Engineering Catalog." Fifteenth Edition, 1930. Published by The Chemical Catalog Co., Inc., New York, N. Y. Cloth, illustrated, 1168 pages, 9 by 12 inches.

This highly esteemed standard reference book, annually revised, is an invaluable compendium of technical data for chemists, chemical engineers, and manufacturers. The work comprises seven sections: namely, Alphabetical Index, Trade Name Index, Classified Index of Equipment and Supplies, Equipment and Supplies Section, Classified Index of Chemicals and Raw Materials, Chemicals and Raw Materials Section, and Technical and Scientific Book Section.

The catalog is distributed in the United States and Canada under two alternative plans. It is sent free of charge to holders of certain classified industrial positions; others pay a designated charge to cover mail and express. A charge of $10 a copy is made to those not included among those classified.

"Trends in the Foreign Trade of the United States." National Industrial Conference Board, Inc., New York, N. Y., 1930. Cloth, 329 pages, 6 by 9 inches. Price, $3.50.

This work analyzes the changes in commodity trade since the World War. The book is one in a series of economic studies dealing with different aspects of our international relations. Part I reviews the factors underlying the changes in commodity trade. Part II analyzes the major world markets for United States exports. Part III states our requirements for foreign products; while Part IV correlates the data presented in a general survey of United States trade.

"A German-English Technical and Scientific Dictionary." By A. Webel. E. P. Dutton & Co., New York, N. Y., 1930. Cloth, 887 pages, 6½ by 10 inches. Price, $10.80.

The material for this book was collected over a period of twenty years and has finally been published to fill the need for a technical and scientific dictionary and work of reference.

This book, in addition to being an exhaustive dictionary of chemical, botanical, and mineralogical terms, contains about 75,000 references, a mass of technical data, numerous chemical formulas, and scientific and botanical terms. A special feature of the volume is that it is keyed throughout for cabling by an unique system of the author's.

"Biennial Census of Manufactures, 1927." U. S. Department of Commerce, Bureau of the Census. Government Printing Office, Washington, D. C., 1930. Cloth, 1497 pages, 5¾ by 9 inches.

This volume of census data on manufactures in the United States, reports the industries in 16 groups, among which rubber products are rated eighth. The rubber group comprises three industries: namely, rubber tires and inner tubes, rubber boots and shoes, and rubber goods other than tires, inner tubes, and boots and shoes. Tabulated data is given under each of these divisions.

Cheap Rubber Attracts Proofers

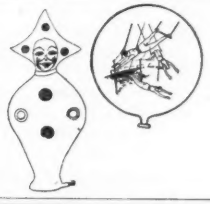
Many makers of waterproofed goods, who, on account of the higher average cost of raw rubber for many years, have found it necessary to use more or less unsatisfactory non-rubber compositions, are, on account of the present exceptionally low prices of plantation crude, said to be revising many of their formulas so as to include the more desirable raw rubber as the main water-resisting material. Improved technique in compounding and applying rubber mixes will, it is said, also play an important part in displacing other hitherto much-used substances in favor of rubber in proofing processes, and all to the greater advantage of producer and consumer.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1296	Manufacturer of rubber foam.
1297	Manufacturer of spring air operation table pad made under the Karr patent.
1298	Manufacturer of Grey's vaginal irrigating tip.
1299	Manufacturer of all-rubber molded acid gloves of shoulder length.
1300	Manufacturer of rubber door silencers.
1301	Manufacturer of a good, popular priced tank ball.
1302	Manufacturer of rubber drinking cups.
1303	Manufacturer of the Bailey rubber tooth brush.
1304	Manufacturer of a rubber pencil box or school companion.
1305	Manufacturer of Syrene or Syren rubber boot for firemen.
1306	Manufacturer of No. 657 balloon cloth.
1307	Manufacturer of "Galacite" used in tires and tubes to prevent punctures.

New Goods and Specialties



Siph-O Vac-U-Cups

ONCE again rubber proves its worth in saving polished floors, in protecting expensive floor coverings, and in eliminating noise and vibration. Such are the attributes of the Siph-O Vac-U-Cups - Floor Levelers, made of new live rubber in black or white and in two sizes, depending on the use for which the cup is intended. In these accessories, here illustrated, the ring vacuum clings to the floor and prevents slipping and scratching, while the cup vacuum absorbs all vibration and noise. According to the manufacturer these cups will not break, scratch, stain, or fade. They are sanitary and durable and cost no more than ordinary casters.

The Vac-U-Cups - Floor Levelers have been found to aid radio reception when placed under the legs of the cabinet. For these "radio shock absorbers" thus absorb any disturbance which might be transmitted to the set. A jolt or a jar often disturbs the elements in the tubes, causing

Rubber Floor Levelers

them to change their relative position and consequently mar the performance of the set.

The use of these floor levelers is not confined to radios. On the contrary their use is widespread. Placed under a piano the rubber vacuums serve to level the floor and improve the tonal quality of the instrument. Electric washing machines, refrigerators, vibrators, adding machines, gasoline motors, billing machines, and battery chargers are a few other types of equipment on which these rubber cups can be utilized. Thus in the home or the office, in hotels and hospitals, in fact almost everywhere will the Vac-U-Cups be an aid. Siph-O Products Corp., 60 India St., Boston, Mass.

New Wexford Kex Quill Plugs

FOR quick, permanent, and dependable tire casing puncture repairs the manufacturer recommends the new Wexford Kex quill plugs fashioned of rubber restrained by a metal quill mounted on a stem. The following directions will reveal the features of this equipment.

Wet the quill with water or cement as

Rubber Plug with Metal Quill

a lubricant and then insert it through the puncture hole from the inside of the casing. The rubber stem compressed in the quill reduces resistance and effort of insertion to a minimum and passes through the casing walls without breaking the fabric cords. With pliers grip the quill on the outside of the casing about ½- to ¾-inch below the point and pull it straight out without twisting. When the plug head inside the casing rests against the casing walls, the metal quill slides off the plug stem and is discarded. After the quill has been pulled off the plug stem, the latter immediately expands to its original size outside of the tire; and when the stem is cut off about ⅛-inch above the surface of the tire, the stem expansion forms a rivet head over the outside of the puncture hole, thus holding the plug securely in position and making a water, dirt, sand, and moisture tight repair. No enlargement of the puncture hole occurs, and the head of the plug inside the tire covers the fabric break and avoids tube pinching.

This quill plug is available in three sizes. No. 11, the standard quill plug with a ¼-inch stem and a 1¼-inch head, and No. 12, the Jumbo quill plug with a ¼- or ⅜-inch stem and a 2¼-inch head, are

Inserting Plug in Tire Casing Puncture

primarily for tire shops and service stations. The Junior Size Outfit, No. 14, for the convenience of small filling stations, repair shops, and fleet and car owners, contains a small quantity of plugs of all sizes and a tube of cement. The Wedler-Shuford Co., 1116 S. Grand Blvd., St. Louis, Mo.

Green Rubber Recoil Pad

AFTER twelve years of research and experimentation the Seamless Rubber Co., New Haven, Conn., has devised a super-resilient, shock absorbing recoil cushion for shotgun or rifle that has many superior qualities. The Noshoc, as it is known, is of a distinctive green color. Its outer shell is a solid rubber cushion, laboratory developed especially for this purpose. The manufacturer states that it will remain soft and resilient for years under all climatic conditions. The inner cushion, a gelatinous mass of a synthetic chemical compound of spongy consistency giving maximum shock absorption is

Noshoc Recoil Cushion

trapped in the live rubber of the outer shell. Thus the impact of recoil is absorbed and dissipated in all directions and has no tendency to elevate or depress the muzzle of the gun. The base plate of semi-rigid rubber conforms exactly to the curve of the butt.

No slots, holes, or openings appear in the Noshoc to collect dirt or moisture. The non-skid shoulder surface prevents slipping. The shock absorbing qualities of this pad extend from heel to toe.

Semi-Rigid Rubber Tray for Frigidaires

AFTER working for some time to simplify removing ice cubes from an electric refrigerator tray, scientists of the General Motors Corp., Detroit, Mich., have developed a semi-rigid rubber tray which ejects one or a trayful of cubes with a flip of the fingers.

The new tray, known as the Quickube, is made of the best grade of rubber, which, being practically free from the adhesion of ice and frost, slides readily from the freezing compartment. It is a complete unit, has a self-sealing front and split grids, which insure the self-leveling of water upon filling.

Financial

Boston Woven Hose & Rubber Co.

TO THE STOCKHOLDERS: Your company, for the fiscal year ended August 31, 1930, showed income carried to surplus of $599,218.78, from which only a deduction of $102,562.82 was necessary on account of inventory and reserve adjustments. While the net profit thus shown is substantially less than last year, I believe it to be a highly creditable showing under prevailing conditions and one that will be very pleasing to stockholders.

The shrinkage in sales for the year has been $1,300,000, or 12.6 per cent, while the poundage shipped has decreased 9,900,000 pounds, or 19 per cent. The greater relative loss in poundage is due to a sharper drop in sales of the cheaper and more competitive grades of merchandise than in the higher grades, which are largely sold through the strong jobbing and distributing outlets of the company. Despite this recession in business, your company has, I believe, fully maintained its position in the mechanical rubber industry, and this is confirmed by very reliable trade statistics.

There has been during the year a decline in price of over 50 per cent in rubber and 30 per cent in cotton duck and fabrics, the principal materials used by your company. This has entirely destroyed the stability of prices in the more competitive lines of merchandise and has in other lines caused our customers to order in such small quantities and for such early delivery as to raise materially the unit cost of manufacture.

STATEMENT OF EARNINGS

	1930	1929
Gross sales	$9,007,925.09	$10,306,714.85
Cost of sales including taxes	8,266,143.86	9,130,783.56
	$741,781.23	$1,175,931.29
Other income	46,997.66	66,177.53
	$788,778.89	$1,242,108.82
Deduction for depreciation	189,560.11	181,724.94
Income to surplus	$599,218.78	$1,060,383.88

SURPLUS ACCOUNT

	1930	1929
Surplus previous year	$2,399,194.15	$2,187,164.37
Income for year	599,218.78	1,060,383.88
	$2,998,412.93	$3,247,548.25
Inventory and reserve adjustments	102,562.82	2,854.10
	$2,895,850.11	$3,244,694.15
Dividends Paid Pref. $45,000.00 Com. $516,000.00	561,000.00	561,000.00
		$2,683,694.15
Plymouth plant reserve		100,000.00
		$2,583,694.15
Reserved for extra dividend and bonus to employes		184,500.00
Surplus end of fiscal year	$2,334,850.11	$2,399,194.15

All items of expense, including depreciation, amounting to $189,560, and taxes, have been taken in accordance with our usual custom. Merchandise inventory has been conservatively valued, raw materials being priced at cost or market, whichever is lower. The low rate of production during the year has made it possible to carry out a very substantial amount of maintenance work, all of which has been charged into operation.

On January 1, 1930, the moving of the reclaiming plant from Plymouth was completed, and the reserve of $100,000 set up last September was applied and our building account reduced accordingly.

Research and development work has been further increased during this year, and the general efficiency of the company's entire organization has been materially improved.

The balance sheet continues to show a very strong cash position and an exceptionally high ratio of quick assets to liabilities.

The company is out of debt and at no time during the year borrowed more than $275,000.

J. NEWTON SMITH,
President and Treasurer.

Cambridge, Mass.
October 20, 1930.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Bibb Manufacturing Co.	Stk.	1½ % q.	.....	.....
Dominion Rubber Co., Ltd.	Pfd.	$1.75 q.	Oct. 3	Sept. 30
Dunlop Tire & Rubber Co., Ltd.	Pfd.	$1.75 q.	Oct. 1	Sept. 16
Electric Hose & Rubber Co.	Com.	$2.00 q.	Oct. 15	Oct. 8
Faultless Rubber Co.	Com.	$0.62½ q.	Jan. 1	Dec. 16
Firestone Tire & Rubber Co.	Com.	$0.25 q.	Oct. 20	Oct. 5
General Tire & Rubber Co.	Com.	$1.00 q.	Nov. 1	Oct. 20
Goodyear Tire & Rubber Co.	Pfd.	$1.75 q.	Jan. 1	Dec. 1
Plymouth Rubber Co.	Cl. B	$0.50 q.	Sept. 15	Sept. 10
Stedman Rubber Flooring Co.	Pfd.	$1.75 q.	Oct. 1	Sept. 26
Thermoid Co.	Pfd.	$1.75 q.	Nov. 1	Oct. 15

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	9 Months, 1929 Number	9 Months, 1929 Per Cent	9 Months, 1930 Number	9 Months, 1930 Per Cent
Motorcycle				
24x3 CC	10,464	0.1	385	0.0
24x3 Std.	4,668	0.0	132	0.0
26x3 CC	1,971	0.0	.....	...
26x3 Std.	1,035	0.0	.....	...
28x3 CC	2,194	0.0	592	0.0
18x2.15 B	22,310	0.1	67,648	0.4
19x2.15 B	16,531	0.1	31,879	0.2
Clincher				
30x3½	261,306	1.2	54,901	0.4
31x4	765	0.0	150	0.0
17" Balloon				
17x3.25 D2	.....	...	40	0.0
17x3.25	.....	...	3,056	0.0
17x4	.....	...	42	0.0
17x4½	.....	...	4,935	0.0
17x5	.....	...	3,789	0.0
18" Balloon				
18x3½	.....	...	645	0.0
18x4	1,216,697	5.8	915,324	6.9
18x3.25	112,381	0.5	78,329	0.5
18x4½	264,583	1.2	104,672	0.7
18x5	78,568	0.4	63,619	0.4
18x6	.....	...	12,370	0.1
18x3.00 D-1	.....	...	83	0.0
18x3.25 E-2	.....	...	7,590	0.1
19" Balloon				
19x2.75	433,976	2.1	2,390,698	15.9
19x3.00	.....	...	580,872	3.9
19x3½	556,407	2.6	181,463	1.2
19x4	3,761,761	17.9	1,429,754	9.5
19x3.25	280,417	1.3	25,923	0.2
19x4½	788,106	3.7	453,452	3.0
19x5	150,342	0.7	112,234	0.7
19x6	.....	...	2,487	0.0
19x2.75 DC	.....	...	39,311	0.3
19x3.00 D1	.....	...	5,172,787	34.4
19x3.00 D2	.....	...	98,453	0.6
20" Balloon				
20x2.75	4,942,262	23.5	32,500	0.2
20x3½	71,509	0.3	46,189	0.3
20x4	1,557,306	7.4	120,622	0.8
20x4½	300,303	1.4	110,777	0.7
20x5	230,382	1.1	12,095	0.1
20x6	37,625	0.2	1,336	0.0
20x4.00 F	13,551	0.1	10,565	0.1
21" Balloon				
21x2.75	132,785	0.6	.....	...
21x2.75 DC	1,521,938	7.2	.....	...
21x3½	306,875	1.5	143,594	0.9
21x4	62,561	0.3	24,862	0.2
21" Balloon (Continued)				
21x4½	54,917	0.3	32,003	0.2
21x5	5,507	0.0	1,529	0.0
21x6	3,668	0.0	3,503	0.0
22" Balloon				
22x3½	170	0.0	.....	...
22x4	1,469	0.0	1,358	0.0
22x4½	1,933	0.0	303	0.0
High Pressure				
30x3½	29,674	0.1	11,695	0.1
32x3½	1,056	0.0	.....	...
31x4	1,086	0.0	.....	...
32x4½	43,169	0.2	10,233	0.1
32x4	28,060	0.1	8,092	0.1
34x4½	3,472	0.0	3,338	0.0
20" Truck				
30x5	2,897,781	13.8	1,952,024	13.0
32x6	373,542	1.8	268,879	1.8
34x7	142,508	0.7	178,716	1.2
36x8	109,573	0.5	93,234	0.6
40x10	669	0.0	.....	...
9-10/20	51	0.0	10,545	0.1
40x10.50	1,075	0.0	1,016	0.0
42x11	.....	...	937	0.0
22" Truck				
36x7	3,021	0.0	2,190	0.0
38x8	10,882	0.0	15,453	0.1
9-10/22	.....	...	1,463	0.0
24" Truck				
34x5	4,915	0.0	1,935	0.0
36x6	30,486	0.1	7,636	0.0
38x7	44,046	0.2	15,647	0.1
40x8	62,720	0.3	41,651	0.3
44x10	246	0.0	383	0.0
9-10/24	9	0.0	4,402	0.0
46x11	.....	...	305	0.0
Airplane				
14x3	1,054	0.0	.....	...
18x3	1,669	0.0	563	0.0
24x3	725	0.0	283	0.0
23x3½	3,007	0.0	514	0.0
27x3½	4,095	0.0	.....	...
28x4	1,546	0.0	.....	...
30x5	221	0.0	.....	...
32x6	904	0.0	209	0.0
36x8	428	0.0	103	0.0
44x10	218	0.0	125	0.0
58x14	.....	...	8	0.0
26x4 Cl.	7,730	0.0	.....	...
Totals	21,018,881		15,010,430	

The Rubber Industry in America

OHIO

The B. F. Goodrich Co. branch managers and assistant managers from all parts of the country held a conference in Akron, O., October 20-22. Robert McTammany, general sales manager, and Willis Behoteguy, merchandising manager, were in charge of the meetings. There were addresses by J. D. Tew, president, and T. G. Graham, vice president of the company. The visitors were taken through the factory and entertained at the Twin Lakes Country Club at a dinner on October 22.

Various branch managers appeared on the program and gave short talks, impersonating the following company officers: E. A. Doerschuk, credit manager; Robert McTammany, tires sales division manager; P. H. Sears, general manager of subsidiary lines; H. J. Linter, sales analyst, and Frank Titus, manager of Pacific coast lines.

The company announced that it is not contemplating adopting a six-hour day because factory schedules are planned as far in advance as possible and with the purpose of providing work for as many employes as could be retained. E. C. Stoner, for twenty years connected with the Goodrich company, is its newest vice president.

H. E. Cook, Goodrich engineering department chief, substituted for James D. Tew, scheduled to address the meeting of department managers and foremen at the City Club on the evening of October 23. Mr. Cook said that one of the most recent achievements of the Goodrich engineering department was the construction of the largest refrigeration plant in Ohio, built in connection with the new wind tunnel, which is being used to experiment with devices intended to remove ice from airplanes in flight.

The meetings, which will be attended by members of the Goodrich staff, will continue throughout the winter. T. B. Farrington, general manager of the factory service division, will be in charge.

The Mohawk Rubber Co., Akron, O., held a three-day session, ending on October 8, of a special sales school for its entire field force to acquaint the men with new plans, policies, and programs of extensive dealer cooperation. Among the speakers were S. S. Miller, chairman of the Mohawk board; Charles Borland, Mohawk president; P. H. Goodall, assistant sales manager; and G. W. Spahr, vice president in charge of sales and advertising and general chairman of the school.

The Miller Rubber Products Co., Akron, O., has appointed E. A. Schneider manager of accessory sales. He was formerly assistant manager and succeeds J. W. Hodgson, who resigned to join The B. F. Goodrich Co., Akron.

Ray Bill Addresses General Tire & Rubber Salesmen

Raymond Bill, president and publisher of INDIA RUBBER WORLD, *Tires, Sales Management,* and other Federated Business Publications, on October 1 addressed the conference of 300 salesmen of The General Tire & Rubber Co., Akron, O., on problems in marketing. The subject of his talk was "Modern Evolution in Marketing."

Blank & Stoller, Inc.
Raymond Bill

"Success in business does not consist alone in piling up a huge volume in sales, but it consists rather in using the money invested in the most helpful way to stockholders and employes.

"As a matter of fact a large volume is often a liability rather than an asset. It has been described as volumitis. . . .

"Business is really a question of men, and the company which starts out with good men will invariably wind up with good men all through the field," Mr. Bill concluded.

William O'Neil, General president, introduced Mr. Bill and called attention to his recent article in *Sales Management* entitled, "Is the Tire Industry America's Worst Managed Business?" In commenting on the article, Mr. O'Neil declared it had a lot of sense to it.

The sales conference, presided over by Mr. O'Neil, was in session the week of September 29. Besides daily talks by the General president, the 300 salesmen from all parts of the country were addressed by S. S. Poor, general sales manager; L. A. McQueen, trade sales manager; and C. J. Jahant, vice president. Other features included a golf tournament and a dinner.

Firestone Tire & Rubber Co. factories in Akron, O., closed the last week of October for the annual inventory taking. The Firestone fiscal year closes Oct. 30.

The Goodyear Tire & Rubber Co., Akron, O., through C. C. Slusser, vice president and factory manager, has announced the adoption of a new working schedule of four six-hour shifts a day with each factory employe allotted twenty-four working hours a week. Office and factory office employes are not affected by this new schedule. It is merely a temporary measure in effect only until business improves. In this way, furthermore, as many employes as possible are kept on the payroll. E. G. Holt, who resigned as chief of the Rubber Division, Department of Commerce, Washington, D. C., last April, to become manager of the Goodyear foreign and crude rubber research department, has returned to his former position. Mr. Slusser addressed employes of the company at the employes' night program at Goodyear Theatre on October 25. This was the first of a series of programs for 1930-31.

Fred M. Harpham, Goodyear vice president, returned last month from a European business trip.

Melflex Products Co., Akron, O., reports that Melflex safety treads have been approved by the Bureau of Safety, Chicago, Ill., for use as switchboard mats in power and sub-stations. The Melflex company also makes a special electro safety pad, which is used in underground construction and distribution.

The Dayton Rubber Mfg. Co., Dayton, O. A. L. Freedlander, vice president in charge of production, recently returned from an extended tour throughout the West and the Southwest, undertaken to study first hand the varied road conditions presented by western travel. While there he made his headquarters at Nelson & Price, Ltd., Los Angeles, Calif., Dayton tire distributer. Mr. Freedlander reports also that Dayton distributers in this territory are doing a splendid volume of business. D. W. Warden, Dayton vice president in charge of merchandising, visited Dayton distributers in New York, Massachusetts, Maryland, and Pennsylvania. Lynn Harvey, manager of tire sales, has an airplane complex, for whenever practicable he uses the airways for all field contacts, thus giving himself more time at the home office.

Ferriot Bros., Inc., 491 Yale St., Akron, O., make steel molds, steel stamps, and do die-sinking for the rubber trade. E. Ferriot, general manager of the concern, reports that business is increasing.

F. A. Seiberling, who was 71, though he does not look his age, on October 6, spent his birthday working industriously in his office, because business was so good he could not spare any time off.

MIDWEST

Firestone, Jr., Rubber Spokesman

Harvey S. Firestone, Jr., one of eight business spokesmen at the seventh conference of major industries held at Chicago, Ill., October 22, said in part as follows:

H. S. Firestone, Jr.

"In 1930 there will be a rubber production of 830,000 tons and a consumption of 665,000 tons. Today the world's stock on hand is 450,000 tons, more than double the stock in 1925. The price of rubber today is 8 cents per pound, the lowest in its history.

"Rubber and fabric together account for over 75 per cent of the total cost of materials in a tire, and as manufacturing costs have steadily declined, they form the major part of the total cost.

"I do not know of any industry that has made greater progress in its manufacturing methods than rubber tire manufacturers have made.

"With such a record, it is not surprising that the rubber industry has grown until today it does a $1,000,000,000 business yearly.

"Our great problem today, which is the major problem in nearly every line of industry, is the readjustment taking place in the field of merchandising and distribution.

"For the tire industry it is intensified by the question of service in its distributing system. Some rubber companies have chosen to manufacture a line of tires under special brands for others to distribute without giving service.

"We feel that the elimination of service to the car owner is a step in the wrong direction. Instead, we believe that the giving of a much more comprehensive service, of a higher standard, is the real answer.

"No industry has the right to look forward to a brighter future than the rubber industry. It furnishes a product without which no automobile can be run, and now we know that, no matter what may be the economic condition, the people will continue to use their cars.

"This year 55,000,000 tires will be sold; last year over 70,000,000 tires were sold.

"Knowing that the use of cars is greater today than ever before, there can be no question that not only the increased mileage which has been built into tires during the last few years is being absorbed, but that an unusually heavy replacement tire business is now in the making.

"For this reason, coupled with the fact that rubber and cotton are at the lowest price in history, removing any reasonable possibility of inventory losses, the rubber industry looks forward with optimism to a successful and prosperous year in 1931."

Palmer-Bee Co., 1701 Poland Ave., Detroit, Mich., manufacturer of conveyers, speed reducers, flexible couplings, fabricated steel, coal and ash handling equipment, and power transmission equipment, has opened the following district offices: Ellicott Sq. Bldg., Buffalo, N. Y., C. E. Jeremias, district manager; Farmers Bank Bldg., Fifth Ave. and Wood St., Pittsburgh, Pa., C. E. Musselman, district manager; Rockefeller Bldg., Cleveland, O., F. B. Barkwill, district manager; Reynolds Bldg., Winston-Salem, N. C., E. S. Davidson, district manager; Bulletin Bldg., Philadelphia, Pa., S. T. Transeau, district manager.

Monsanto Chemical Works, St. Louis, Mo., at a meeting of the board of directors on October 7 elected G. Lee Camp vice president. He was formerly sales manager for the Dow Chemical Co., Midland, Mich., until his resignation more than a year ago. After a year of rest and travel Mr. Camp, on July 7, 1930, joined Monsanto as assistant to the president.

The National Tire Dealers' Association will hold its convention at the Hotel Sherman, Chicago, Ill., on November 3, 4, and 5.

The Johns-Manville Co. announced that H. A. Githens, former vice president of the Federal Rubber Co., Cudahy, Wis., has joined its organization at Milwaukee, Wis., to handle the sale of Johns-Manville insulated building material for houses.

Thomas D. Danforth, formerly chief engineer of the Mansfield Tire & Rubber Co., Mansfield, O., and previous to that a member of the Goodyear and the Firestone industrial engineering staffs, is now in charge of the industrial engineering work at the Chicago, Ill., office, 140 S. Dearborn St., of Scovell, Wellington & Co.

International Rubber Co., R. C. Sudbury, Maine Hotel, Pueblo, Colo., has work under way on a first unit of a factory for the manufacture of garden hose, inner tubes, fan belts, and other rubber products. The total cost is $200,000.

Transcello Paper Co., 654-68 W. Virginia St., Milwaukee, Wis., manufactures Transcello, a new transparent paper, which is said to be inexpensive, greaseproof, moistureproof, dustproof, and sanitary. Nor is it affected by acid, alkali, or oxidizing agents of ordinary concentrations. Transcello, in consequence, is recommended by its manufacturer as well adapted to the individual wrapping of rubber goods.

United States Rubber Co.

A daily production schedule 22 per cent greater than August was maintained during September by the tire department of the United States Rubber Co., Detroit, Mich. It is planned to continue this increased production schedule through October. Increased production is unusual at this time, states J. F. O'Shaughnessy, general manager, because tire production usually tapers off toward the end of August and is at a seasonal low ebb for the remaining months of the year. The September schedule will be tied with June for the third greatest production month of this year, being exceeded only by April and May, the peak production months for tires.

Despite these production records United States tires show an inventory of finished tires, both at Detroit and in the field, of 25 per cent below September of last year. Employment statistics at the plant show that labor has been maintained at a fairly consistent level.

Mr. O'Shaughnessy attributes the increasing production to extension and increasing of the dealer organization and the somewhat upward trend noted in a number of basic lines of business.

The U. S. Tire Department has been awarded the tire contract for the busses to be used on the Detroit-Windsor tunnel under the Detroit River. When the tunnel opens, 30 twin coaches of 40-passenger capacity each will be used. The tunnel is to be entirely vehicular and will make the third mode of spanning the Detroit River between the United States and Canada at Detroit, as ferries and a bridge are the other two.

M. F. Blakeslee

L. M. Simpson, general sales manager of the Tire Department, announced the appointment of M. F. Blakeslee as manager of tire sales of the Dallas District. Prior to this appointment Mr. Blakeslee was engaged in special merchandising work for the company at the Detroit office.

The Harshaw Chemical Co., Cleveland, O., announces the opening of its Detroit, Mich., office, with R. R. Davis in charge, at Central Detroit Warehouse, Fort at 10th. Telephone, Cadillac 0444.

EASTERN AND SOUTHERN

Kelly-Springfield Tire Co., Baltimore, Md., has announced the promotion of J. J. Jordan, who will take over sales direction, succeeding the late Thomas S. Lindsey, who had been Mr. Jordan's immediate superior. The new sales chief has been with Kelly-Springfield about eight years and prior to that was with the old Diamond Rubber Co.

The Goodyear Tire & Rubber Co., Akron, O., recently opened a new, modern wholesale branch in Jacksonville, Fla. According to Herbert F. McClure, manager of the branch, the reason for expanding facilities was the growth of Goodyear's business in tires, belting, hose, packing, and rubber flooring.

Rubber Exchange Officials

John L. Julian was on October 21 unanimously elected president of the Rubber Exchange of New York, to succeed F. R. Henderson, who had been president since the organization of the Exchange in 1925. William A. Overton was elected vice president, and J. C. Cuppia reelected treasurer.

The new president, who assumed office at noon on October 23, is a partner in the New York Stock Exchange firm of Fenner & Beane. He was born in Tuscumbia, Ala., and for the past several years has specialized in cotton. He has been a member of the Rubber Exchange since 1926. Mr. Overton, vice president-elect, is with Geo. H. McFadden & Bro., and Mr. Cuppia is a partner of E. A. Pierce & Co.

Three new members were elected to the Board of Governors and nine of the present members reelected. The new members of the board are Robert L. Badenhop, Robert Badenhop Corp.; Hutcheson Page, Rogers, Brown & Crocker Bros., Inc.; and Charles Slaughter, Slaughter, Horne & Co. Members of the board reelected were Harold L. Bache, William E. Bruyn, James T. Bryan, Herbert S. DeLanie, J. Frank Dunbar, Jr., F. R. Henderson, Jerome Lewine, Fred Pusinelli, and Edward J. Wade.

Blank & Stoller, Inc.

John L. Julian

Inspectors of election who were elected are Frank D. Pressinger, R. L. Chipman, and Leroy Wood.

United Carbon Co., Charleston, W. Va., which less than a year ago introduced itself to the purchasing departments of the carbon black trade in selling direct its own product, wishes to remind the trade that United is ever ready to give full protection in the way of price, quality and service. The company is prepared also to offer the best possible cooperation with the technical staffs in any industry that consumes carbon black. Oscar Nelson is the United president and general manager. The company recently completed a new plant at Charleston and invited five research and development engineers from The Goodyear Tire & Rubber Co., Akron, O., to inspect it. The United Carbon Co. sent a plane to the Akron municipal airport to get these men: Dr. L. B. Sebrell, W. W. Stephens, H. J. Osterhof, J. P. Maider, and H. R. Thies.

F. B. Davis, Jr., president of the United States Rubber Co., New York, N. Y., has announced that B. E. Marean, first vice president of the Electric Hose & Rubber Co., Wilmington, Del., joined the U. S. organization on November 1. Mr. Marean has made an outstanding record in the production activities of the Electric Hose & Rubber Co., with which he has been associated for a great many years.

The Bibb Manufacturing Co., Macon, Ga., manufacturer of tire fabrics, declared quarterly dividends of 1½ per cent on stock of $25,000,000, and also the usual bonus to all employes. Officers elected at the annual meeting were: W. D. Anderson, president and chairman of the board; James H. Porter and W. D. Anderson, Jr., vice presidents; A. A. Drake, Jr., secretary-treasurer; Charles C. Hertwig, assistant secretary and treasurer. The Bibb company now operates on a two-day a week schedule, as a temporary measure.

The Pennsylvania Rubber Co., Jeannette Pa., through President W. O. Rutherford has appointed Jonathan F. Jones as western district manager in charge of Detroit, Chicago, Kansas City, and Dallas regional zones. Mr. Jones formerly was vice-president in charge of sales with the Mohawk Rubber Co., Akron, O., where he won an enviable reputation with his outstanding achievements.

The Thirteenth Exposition of Chemical Industries will be held at the Grand Central Palace, New York, N. Y., during the week of May 4, 1931. The students' Course of Lectures again will be given under the chairmanship of Professor W. T. Rand, Dean of Chemistry, Rutgers University. Already about three hundred exhibitors have reserved space for the forthcoming exhibition.

T. W. Dodds, for several years with the *National Petroleum News,* New York, N. Y., has joined the Hartol Products Corp. in charge of the New York State territory for that organization, succeeding K. H. Dunbar, who is now in charge of sales in the New England division.

E. W. Balding, of the New York Belting & Packing Co., 91 Chambers St., New York, N. Y., is vacationing in Europe, having sailed on September 26 on the "S. S. Caronia." Mr. Balding is very well known in the mechanical rubber goods trade, having been active in sales work in this field for the past thirty-five years.

E. W. Balding

E. C. Sweeney has announced his resignation as vice president of Whitehouse, Davis & Co., Inc., and that he will continue as importer and dealer in crude rubber at the same address, 27-29 Water St., New York, N. Y. Telephones, Whitehall 2540, 8140, 4574.

P. M. Scholz, chief chemist of K.D.P., Ltd., 28 Fenchurch St., London, England, producers of special latex and latex products, passed through New York, N. Y., last month on his return to England from Singapore.

St. Joseph Lead Co., 250 Park Ave., New York, N. Y., has announced that E. V. Peters has become sales manager of its zinc oxide department, with headquarters at the New York office. The company's new plant for manufacturing zinc oxide, at Josephtown, Beaver Co., Pa., will begin operations about January 1, 1931. The technical and sales staff is always ready to cooperate with users of zinc oxide.

Southern Textile Exposition

The Ninth Southern Textile Exposition was held at Greenville, S. C., on October 20-25, 1930. The list of exhibitors displaying machinery, equipment, and materials of interest to the textile industry included the following concerns: Aluminum Co. of America, American Hard Rubber Co., The Bristol Co., H. W. Butterworth & Sons Co., Carolina Rubber Co., Carrier Engineering Corp., Curtis & Marble Machine Co., Dayton Rubber Co., E. I. du Pont de Nemours & Co., Inc., Eberhard Faber Pencil Co., General Electric Co., Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Roessler & Hasslacher Chemical Co., Henry L. Scott & Co., C. J. Tagliabue Co., Taylor Instrument Co., and Textile Finishing Machinery Co.

Kleinert's New Steam Plant

A group of 20 engineers and manufacturers met on October 7 at the I. B. Kleinert Rubber Co.'s factory at College Point, N. Y., to inspect the new steam boiler plant just completed by Walter Kidde Constructors, Inc., 140 Cedar St., New York, N. Y. This installation is notable because it is the first of its type to be erected for the operation of an industrial plant, previously having been employed only in public utility power stations. After inspecting the exterior of the new boiler, coal storage silos, and fuel feeding facilities the party assembled in the combustion chamber of the boiler, where lunch was served. This was followed by a brief description of the steam plant, and a demonstration was given of the fire box draft and the steam jet system for removal of soot deposit upon the boiler tubes. Following these demonstrations President R. K. Guinzburg christened the boiler by breaking a bottle of mineral water upon the grate and igniting the drying out fire preliminary to the production of steam in the boiler on October 20, 1930.

View of Boiler Combustion Chamber

Left to right back row: Walter Kidde and B. G. Worth, of Walter Kidde Constructors, builders of the plant; R. J. Stormont, Wickes Boiler Co.; F. K. Page, furnace builder. Seated: P. R. McCampbell, works manager, C. B. Mergentime, treasurer, A. B. Salinger, secretary, H. I. Kleinert, vice president, R. K. Guinzburg, president, and George Guinzburg, all of Kleiner: Rubber Co.; J. V. Santry, president, Combustion Engineering Co.; Webster Norris, of INDIA RUBBER WORLD; M. D. Carroll, of Prat-Daniel Co., dust collecting stack manufacturers. Front row: Charles Kortzendorf and A. B. Salinger, Jr., of Kleinert Rubber Co.; H. A. Cozzens, of American Hard Rubber Co.

The F. R. Henderson Corp., crude rubber broker, has moved from 44 Beaver St. to 89 Broad St., New York, N. Y. The telephone number is Whitehall 3683.

Scully Rubber Mfg. Co., Highlandtown Station, Baltimore, Md., recently incorporated, manufactures Scully and Aristocrat goods, including products for the plumbing trade, molded specialties, tank balls, and steel wool holders. The officers are: Saul Schulhoff, president and purchasing agent; Peter Fritz, vice-president; Selma Freeman Schulhoff, secretary; and Joseph L. Fritz, treasurer.

Westinghouse Memorial Dedicated

The nation's leaders of industry, business, and scientific research paid homage to the late George Westinghouse, founder of the many Westinghouse industries, in the dedication of a memorial to the industrial leader in Schenley Park, Pittsburgh, Pa., held on October 6.

Assembled in a setting of unusual natural beauty, they observed the unveiling of the monument erected by the Westinghouse Memorial Association, composed of 54,251 members, mostly Westinghouse employes, who, with the assistance of appropriations made by the Westinghouse Electric & Manufacturing Co. and the Westinghouse Airbrake Co., financed the undertaking in tribute to their founder.

NEW ENGLAND

The New England Purchasing Agents held their silver anniversary dinner in Boston, Mass., on October 20, with about 200 in attendance. C. D. Garretson, president of the Electric Hose & Rubber Co., Wilmington, Del., was one of the speakers.

The United States Rubber Co. moved its branch in Springfield, Mass., from 101 Taylor St. to 50 Hillman St.

The Sherer Tire Store opened last month at 47 Federal St., Worcester, Mass., carrying a full line of United States tires and tubes. The new store will be run in connection with the main store of the company, a local department store, where a full line of United States rubber footwear is also featured.

Joseph Clancy, proprietor of the Massachusetts Tire Sales Co., Boston, Mass., is taking a vacation in New Hampshire.

The Fisk Rubber Co., Chicopee Falls, Mass., has appointed H. C. Hanson general sales manager. Formerly he was in charge of the manufacturers' sales division and was made acting sales manager following the recent resignation of C. M. Piper. It is rumored that Fisk soon will manufacture ruber sundries for the home in addition to tires and tubes, which now constitute the company's only products.

Tercentenary Year in Massachusetts. In connection with the celebration of the 300th anniversary of the founding of the Bay State, manufacturers staged a huge 2-week exhibit, known as the Tercentenary Industrial Exposition, at Mechanics Building, Boston, Mass., under the auspices of the Associated Industries of Massachusetts. Among the most attractive booths were those of rubber manufacturers. The Hood Rubber Co., Watertown, displayed a complete line of rubber footwear, including Raintogs, heavy rubber footwear for farmers, sporting boots, children's footwear, and rubber soled shoes for sports and athletic wear. Special booklets giving the story of rubber, rules for tennis, basketball, etc., and hints on the care of children's feet, were distributed. The Tyer Rubber Co., Andover, Mass., also showed heavy rubber footwear as well as rubber sundries, bands, bladders, tubing, roll covering, and specialties. An interesting display of rubber stamps was made by the R. Woodman Mfg. & Supply Co., Boston. Another colorful exhibit of rubber soles was by the Avon Sole Co., Avon, Mass., maker of Du-Flex rubber products. The President Suspender Co., Shirley, Mass., featured rubberized and elastic belts, suspenders, garters, etc. The Archer Rubber Co. and E. I. Du Pont de Nemours & Co., Inc., also had very interesting exhibits.

The United Electric Railways, Providence, R. I., equipped with tires of the United States Rubber Co., New York, N. Y., was awarded one of the most valued prizes in the industry—the Bus Transportation first award, Class A. This is a $500 cash award and metal plaque "for the most outstanding example of progress made in maintenance practices and methods." The Class A award was for companies operating 3,500,000 or more bus-miles annually in revenue service. Official data discloses that pull-ins resulting from tire failure have been reduced 79 per cent for the period during which U. S. tires have been used on United Electric Railway buses.

The Firestone Cotton Mills, New Bedford, Mass., tire fabric manufacturer, will start operations November 3 on full-time schedule. The plant, a subsidiary of the Firestone Tire & Rubber Co., Akron, O., shut down October 3 because of lack of orders. The summer schedule was a three-day week.

The Archer Rubber Co., Milford, Mass., has arranged to introduce group life insurance among its employes. General Manager John T. Callahan reports that all 500 Archer employes will benefit by this plan.

Dewey & Almy Chemical Co., Cambridge, Mass., recently purchased the Multibestos Co., Walpole, Mass. The chief products are rubber bonded clutch facings and rubber bonded flexible and rigid molded brake linings. Much latex, of which Dewey & Almy is a very large importer, now goes into the manufacture of brake linings and clutch facings. Charles Almy, Jr., is president of the company.

Chairman Textile Committee N. A. P. A.

Robert C. Kelley, purchasing agent of Converse Rubber Co. and Hodgman Rubber Co., has been appointed National Chairman of the Textile Committee of the National Association of Purchasing Agents, succeeding E. H. Hawkins of the E. I. du Pont de Nemours & Co., Inc., who resigned on account of his new duties as vice president of the Association.

Mr. Kelley is widely known in the rubber trade, having been active in the field for twelve years. He went to work in the factory of the Converse Rubber Shoe Co. on December 30, 1918, after fourteen months of service in the army, where his specialty was the field of supply. His first job at Converse concerned waste control and salvage and he gradually worked through various departments such as cutting, cloth inspection, and raw material storage, until July 1, 1925, when he entered the employ of the Hood Rubber Co. in the heel and sole division. On April 1, 1926, he returned to the Converse company as purchasing agent, and following the purchase of that company by interests allied with the Hodgman company, Mr. Kelley took over the purchasing for both companies.

Robert C. Kelley

Mr. Kelley has written extensively for newspapers and magazines. At Harvard, where he was graduated in 1917, he managed one of the undergraduate papers and worked as a reporter for several Boston newspapers. In 1924 he was coauthor of a book on "Material Planning and Control" published by the Boston Chamber of Commerce; and he has written many articles for India Rubber World and other trade magazines. For the past three years he has taught purchasing, storekeeping, and commodity analysis in the evening division of Northeastern University, School of Commerce and Finance, and has frequently spoken before Rotary Clubs and other organizations on "Rubber" and "Buying."

Robert Kelley was born in Dorchester, Mass., on January 2, 1895, and now resides at 503 Walnut St., Newtonville. He is a member of Mt. Vernon Lodge A. F. and A. M. Malden, Newton Royal Arch Chapter of which he holds the office of scribe this year, and Gethsemane Commandery No. 35 Knights Templar of Newtonville, the American Legion, New England Purchasing Agents Association, and KGX Club of Harvard.

NEW JERSEY

Little change took place in the rubber industry in New Jersey during the past month, and no radical changes are expected during the fall. The only field not showing any substantial increase is hard rubber. Plants making tiling, hose, and belting are running to capacity. The demand for tires and tubes is not increasing and these plants have decreased their production schedules from those of early summer months. The shoe and heel industry remains good.

Robert J. Stokes, president of the Southern Asbestos Co., subsidiary of the Thermoid Company, announces that sales of the southern concern showed an increase of 85 per cent during September as compared with the preceding month. Mr. Stokes announced the declaration of the regular quarterly dividend of $1.75 a share on the 7 per cent cumulative preferred stock, payable on November 1 to stockholders of record October 15.

Weldon Roberts Rubber Co., 18 Oliver St., Newark, plans alterations to a two-story basement brick and steel factory building at 361-65 Sixth Ave. The work will cost $40,000.

Whitehead Bros. Rubber Co., Trenton, reports booming business in all departments. The company had been operating five days a week and now runs on Saturday.

School of Industrial Art, Trenton, has closed its department of rubber technology, which had been conducted for several years. The class was for shopmen, foremen, and superintendents of the various Trenton rubber mills. Some plant officials were deeply interested in these courses, and many employes were much benefited by the study. When some of the Trenton rubber plants closed, attendance at the school dropped; so Dr. Frank Forest Frederick, head of the Art School, discontinued the rubber classes.

Murray Rubber Co., Trenton, continues to operate normally. Some machinery formerly used by the company for manufacturing mechanical goods has been liquidated. The concern will eventually dispose of all such equipment to have room for making tires and tubes.

Pierce Roberts Rubber Co, Trenton, continues under normal conditions.

Lambertville Rubber Co., Lambertville, reports that business remains fairly good. The company specializes in rubber footwear.

The Rubber Manufacturers' Association of New Jersey held its fall meeting and dinner on October 14 at the Trenton Club, Trenton. Practically all the rubber companies of Trenton, as well as many others in the State, were represented. A. L. Viles, of New York, general manager of The Rubber Manufacturers' Association, was the guest of the evening and spoke on the rubber situation in general.

Puritan Rubber Co., Trenton, is working on some good-sized contracts, which will keep the plant running normally for some time. The company specializes in rubber flooring.

Essex Rubber Co., Trenton, is experiencing improved business with each month. The concern says conditions assure a good fall and winter season.

Joseph Stokes Rubber Co., Trenton, now operates at 100 per cent capacity. The company is erecting a new building, 40 by 70 feet, for manufacturing hard rubber goods. The Stokes company plant in Canada is also running to capacity.

J. Edward Myers, superintendent of the Acme Rubber Mfg. Co., Trenton, has returned from Avon, where he spent some time with his family.

Crescent Insulated Wire & Cable Co., Trenton, reports increasing business. Day and night shifts are employed in the braiding, burning, and assembling departments.

The Thermoid Company, Trenton, will hold its annual conference for its sales managers at Trenton this month. Business matters for the winter months will be discussed and instructions given.

Luzerne Rubber Co., Trenton, reports that business shows a little improvement over last month.

Pocono Rubber Cloth Co. reports that business conditions are better than the previous month and that a full day crew is at work.

Tire Production and Shipments

Inventories of pneumatic casings on hand on August 31 were at the lowest levels since October 31, 1927, according to statistics issued by The Rubber Manufacturers Association, Inc. There were 11,570,885 casings on hand on August 31, a decrease of 8 per cent under July 31 of this year and 19 per cent below August 31, a year ago.

Shipments of pneumatic casings for August amounted to 5,519,867 and represents a decrease of 5 per cent under July, 30 per cent under August, 1929, and 34 per cent under August, 1928.

Production of pneumatic casings for August is placed at 4,443,319, an increase of 4 per cent over July, although 23 per cent under August a year ago and 41 per cent below August, 1928.

Shipments of pneumatic casings for the first eight months of 1930 exceeded production by 2.5 per cent as compared with a 1 per cent excess of production over shipments in same period in 1929 and .6 per cent in 1928.

PACIFIC COAST

U. S. Acquires Samson

United States Rubber Co., Inc., has formally announced acquisition of the Samson Tire & Rubber Corp., Los Angeles, Calif. The United States company in thus taking up tire manufacturing on the Coast will gain distributive advantages in the far western field comparable with Goodyear, Firestone, and Goodrich, which have factories on the Coast. A considerable benefit also will be the elimination of delays in deliveries due to long freight hauls from Detroit, and the attendant expense.

Molds and other equipment for U. S. tires are being shipped from Detroit to the Samson factory, and actual production of such tires is expected to start in December. Meanwhile J. B. Magee, Pacific Coast tire sales manager, who was recently transferred by President E. B. Davis from San Francisco to Los Angeles, will move his headquarters from the United States company branch at San Pedro and Eighth streets to the Samson plant, whence he will direct all tire merchandising in the eleven far western states.

In addition to making its own tires at the southwest plant, the United States company will continue the manufacture of tires for nation-wide chain store concerns which have been supplied by the Samson company, which volume of business is said to amount to several million dollars annually. In order to carry out such contracts in addition to its own production the new interests will steadily increase the capacity of the modern, well-equipped Samson plant from 6,000 tires and 10,000 tubes daily to about 10,000 tires and 20,000 tubes.

A new corporation will be formed under the laws of Delaware with 200,000 shares of authorized 6 per cent noncumulative preferred stock of $10 par value, 200,000 shares of authorized A common stock without par value, and 200,000 shares of B common stock without a par.

The rubber company will purchase 120,000 shares of A common stock and 50,000 shares of B common for $600,000.

The new firm will purchase 60,000 shares of the Samson unissued preferred stock for $600,000, proceeds to be used in retiring current bank obligations of the Samson company.

Goodyear Tire & Rubber Co., Los Angeles, Calif., states that production is normal for the season and that the sales outlook is quite encouraging. Following their recent conference at the plant of the parent Goodyear plant in Akron, the superintendents and department managers have been introducing various improvements in production operations, the advantages of which will, it is said, be considerable as soon as the pressure of orders becomes more urgent. A recent visitor was W. B. Urquhart, superintendent of the Goodyear works in Australia, who sailed from San Francisco on October 17.

Pacific Tire & Vulcanizing Co., 135 W. Jefferson St., Los Angeles, Calif., one of the largest retreading concerns on the Coast, has found it necessary on account of increasing business to move to new quarters and install much additional equipment at 133 W. Jefferson St.

New Life to Rubber Co., 102 N. Long Beach Blvd., Compton, Calif., has recently been increasing its facilities for making a preparation said to preserve new and revive old rubber, especially tires. It is represented in Los Angeles by E. M. Bergsvik of the National Bank of Commerce, 429 S. Hill St.

Harry O. Bock, for 17 years with the United States Rubber Co., and latterly assistant branch manager in Los Angeles, has been transferred to the main sales offices in Detroit, Mich.

Perfect Caster Mfg. Co., 3517 E. 11th St., Long Beach, Calif., makers of rubber swiveling wheels for trucks, furniture, etc., finds business much improved of late. The concern is headed by Harold G. Cogswell, formerly of the Paragon Rubber Products Co., Los Angeles, Calif.

Firestone Tire & Rubber Co. of California is operating its factory in Los Angeles twenty-four hours a day for six days a week, according to Vice President and General Manager R. J. Cope, who also reports a recent and substantial increase in orders from all of the eleven far western states served by the plant. Recent visitors included George Crackel, of Honolulu, Firestone sales manager in the Hawaiian Islands; and H. C. Miller, of Akron, O., auditor of all Firestone subsidiary companies. Vice President and General Sales Manager R. C. Tucker planned to leave for Akron, November 1 for a conference.

West American Rubber Co., Los Angeles, Calif., had a large exhibit at the recent oil industry show in Tulsa, Okla. Vice President Charles Lamb attended the show and later went to St. Louis and New York. Business is picking up very well in standard and specialty lines, according to President Douglas Radford.

Darnell Corp., Ltd., Long Beach, Calif., manufactures all the rubber products used in the caster wheels and interior glides in which this company specializes.

American Rubber Producers, Inc., subsidiary of Continental Rubber Co., 1775 Broadway, New York, N. Y., is not only extending operations at its guayule experimental station at Salinas, Calif., but has well under way the construction of a milling plant at Spence, about ten miles south of Salinas, which it is planned to have in operation about January 1, 1931. Centrally located, it is being designed to take care of the guayule planted by the company on over 5,000 acres in California; 800 acres of which are coming into bearing this year after four years' growth. The establishment will have all the grinding, crushing, flotation, and like facilities found at the Continental's main guayule plant in Torreon, Mexico, but modified to suit local planting and other conditions. It will be the first factory for the production on a commercial scale of home-grown rubber on the Coast.

Pacific Coast Rubbermen Golfers

Forty-nine leading members of the rubber industry took part in the eleventh annual tournament of the Pacific Coast Mechanical Rubbermen's Golf Association at the Orinda Golf & Country Club, Oakland, Calif., on October 6 and 7. The affair was regarded as one of the most enjoyable the association has ever held.

The Seattle Brass Co. trophy for low net in the qualifying round was won by C. M. Bliven; J. B. Watson, the W. C. Hendrie Co. trophy, low gross, qualifying round; E. H. Stevens, placque and Boston Woven Hose & Rubber Co. trophy, championship flight; M. S. Sprague, American Rubber Mfg. Co. trophy, runner-up, championship flight; K. E. Johnson, Plant Rubber & Asbestos Co. trophy, championship flight, defeated four; G. C. Spokesfield, J. B. Lippincott Co. trophy, first flight; W. Art. Corder, Colt's Patent Fire Arms Co. trophy, runner-up, first flight; R. I. Lang, Paris Inn trophy, first flight, defeated four; W. Kugler, Johns-Manville Co. trophy, second flight; C. K. Everett, W. D. Allen Mfg. Co. trophy, second flight, runner-up; Henry Martine, L. A. Rubber & Asbestos Co. trophy, second flight, defeated four; Irvin Reed, Republic Rubber Co. trophy, third flight; F. H. Swaine, Goodyear Tire & Rubber Co. trophy, third flight, runner-up; D. W. Wright, Pioneer Rubber Mills trophy, third flight, defeated four; George Lee, L. P. Degen Belting Co. trophy, fourth flight; W. A. Whitehead, Goodyear Rubber Co. trophy, fourth flight, runner-up; R. I. Lang, Pacific Coast Rubber Co. trophy, hole-in-one; K. E. Johnson, Victor Balata & Textile Belting Co. trophy, putting contest; and consolation prizes of golf balls were provided by the United States Rubber Co. and the Linear Packing & Rubber Co.

The affair concluded with a banquet. W. Art Corder was chosen president for 1931, and Tim Horan vice president. Mr. Corder will select the secretary and the treasurer. The next tournament will be held in Los Angeles on the first Monday and Tuesday of October, 1931.

General Tire & Rubber Co., Akron, O., had as guests in October, Dan A. Kimball, western district manager; E. R. Wood, assistant division sales manager; Howard Stroupe, special truck and bus tire sales manager; and Roy Doss, branch manager, all of San Francisco, Calif.; and W. F. Lynch, Los Angeles branch manager. Ben Heer, special sales representative from Akron, has just finished a trip among the major coast cities and reports business as decidedly improved in the past few weeks. Annual sales conferences will be held in Seattle, San Francisco, and Los Angeles in January, and President Wm. O'Neil is scheduled to attend them.

Willard Rubber Co., Ltd., 2320 Newton Ave., San Diego, Calif., licensee under Cyrus Field Willard patents, is doing a good business in devulcanizing rubber into solution at one operation

and making various products such as liquid rubber paints, belt dressings, etc., including an aluminum heat-resisting pigment testing up to 700° F.; and is also using the solution in making "Rubber Turf" and "Rubber Velvet" waterproof materials to replace felt and cottonseed hulls for covering miniature golf courses.

Elston E. Wadbrook, formerly of Poole & Arnold, rubber importers, New York, N. Y., and prominent in founding the New England Rubber Club, forerunner of the Rubber Manufacturers' Association, has been visiting his son, a lieutenant in the Marine Corps, San Diego, Calif., and recently met another son in charge of the aerology department at the U. S. A. Asiatic Station.

Dayton Rubber Mfg. Co., Dayton, O., has recently been making a special study of coast trade conditions through Vice President and Factory Manager A. L. Freedlander, who reports finding the outlook very encouraging. Frank T. Price, president of Nelson & Price, Los Angeles, Calif., chief Dayton distributers on the Coast, left early in October for Dayton, where he was to meet Edward F. Stanton, merchandising manager of his concern, there to confer with Dayton executives about new selling policies which have been found successful in the southwestern field.

Farrel-Birmingham Co., Inc., Ansonia, Conn., finds demand increasing steadily for various types of rubber-makers' machinery in the coast field, according to its visiting representative, Howard Parkerton.

R. B. Springfield, formerly chief chemist of the Goodyear Tire & Rubber Co., Los Angeles, and latterly of the Golden State Rubber Mills in the same city, is now a member of the firm of Stringfield & Oedekerk, 762 E. Slauson Ave., Los Angeles, makers of molds and dies for bakelite, rubber, etc., specializing as chemical engineer.

California Golf Products Co., manufacturers of golf balls, 3024 Roslyn St., Los Angeles, Calif., has opened a factory branch at 577 14th St., Oakland, Calif.

Pacific Goodrich Rubber Co., Los Angeles, Calif., reports a steadily improving trend in sales and is stepping up production weekly. Sales Manager F. E. Titus, Manager of Pneumatic Sales H. S. Wheeler, and Merchandising Manager R. E. Jeffers attended a mid-October conference at the executive offices of the parent Goodrich company in Akron and helped in planning the general sales program for 1931. Advertising Manager E. T. Morris has been transferred to Akron to assist Advertising Manager P. J. Kelly of the parent company. Guy Gundaker, Jr., was made sales promotion manager, a new position. Goodrich Silvertown, Inc., has lately added several superservice stores to its Pacific Coast group, bringing the total to 56.

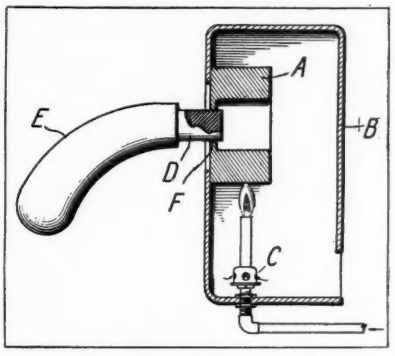
Carbon Products Corp. has completed its new factory at 6000 Eastern Ave., Montebello, a suburb of Los Angeles, Calif., and expects to have it in full operation within a couple of months. The company manufactures a rubber makers' black solely from crude petroleum by a new process. The product is said to compare well with many standard grades of carbon black. The officers are: president, R. R. Langley; vice president, Hugh S. Jenkins; secretary and treasurer, J. C. Westbrook; who, with L. M. Lockhart, A. J. Delaney, Jack Doyle, and John McKeon, chairman, comprise the directorate.

Rubber Lining

A new money-making role for rubber has been devised. At the United States Bureau of Engraving and Printing, Washington, D. C., electrolytic iron printing plates, ¼-inch thick, are now made in steel plating-tanks lined with acid-resisting rubber, the rubber being protected from mechanical injury with a cypress board sheathing.

Sizing Hard Rubber Handles

Hard rubber handles should be securely fitted to tubular extensions of vacuum



Hard Rubber Sizing Die

cleaners and other machines. The handle is usually molded with a reduced cylindrical extension to be inserted in the end of the tube forming a tight fit by friction. This is unsatisfactory because hard rubber handles cannot be molded to fit; moreover they are also difficult to machine accurately. However, a novel patented process[1] solves this problem simply and effectively.

It has been discovered that if such a vulcanized rubber article, molded to slightly oversize, is caused to contact progressively with a narrow edged die heated to a temperature sufficient to burn off the surface rubber, the latter will be removed without injury to the underlying rubber. The telescoping extension will thus be given the desired accurate fit.

A simple means for thus sizing the fit by burning is indicated in the accompanying illustration, where the sizing die *A* is shown attached to the inside wall of a box *B* and over a gas lamp *C*. The sizing operation consists simply in pushing the extension *D* of the handle *E* past the cutting edges of the die opening *F*.

[1] U. S. Patent No. 1,754,993, Apr. 15, 1930.

Obituary

Sir Francis Watts

IN THE recent death of Sir Francis Watts, C. M. G., D. Sc., F. I. C., F. C. S., since 1908 Imperial Commissioner of Agriculture for the West Indies, the British Government loses one of its most valued colonial departmental administrators and the world one of its foremost authorities on tropical agriculture. When his government had decided to study the possibilities of rubber-growing in its western as well as its eastern possessions, on him devolved the major share of the work of directing the selection and cultivation of Hevea and Castilloa trees for the experiment station at Port of Spain, Trinidad, and in Dominica and Tobago, British West Indies; and the knowledge gained regarding soil, climate, and potential production of rubber and other commodities in the Caribbean Zone was generously shared by him with Americans and others.

To supplement the work of the chief station at Barbados, Sir Francis induced his government in 1921 to establish on the Island of Trinidad what has since become the important British West Indies Agricultural College, and he not only gave it constantly the benefit of his extensive experience in practical botanical lines, but also found time to act as consulting officer in agricultural matters to the Governments of Jamaica, British Guiana, and Trinidad, as well as to edit many scientific periodicals.

Sir Francis was born in England on November 1, 1859, and married Miss Louisa Kayne in 1883. They had two sons and two daughters. He was educated in private schools and in Mason College, Birmingham. Entering the colonial service, he was appointed a government analytical chemist, serving in Antigua from 1889 to 1898 and in Jamaica in 1898-99. He was a member of the Executive Council, Leeward Islands, in 1889 and that of Antigua in 1893. He was appointed to the Legislative Council of Trinidad in 1898 and was government chemist and superintendent of agriculture of the Leeward Islands from 1899 to 1909, finally succeeding Sir Daniel Morris, who retired, as imperial commissioner.

He became a Fellow of the Chemical Society in 1883, an associate of Mason College in 1889, and at Birmingham in 1902 was given a doctor of science degree. In recognition of his services to the empire he was a knight and commander of the Order of Michael and George. Sir Francis was the author of many scientific works of high value and wide circulation.

Rubber Paving Cost

A British firm is marketing a rubber paving block at a price that brings it into competition with granite sets, that is, as low as $11.50 per square yard. It is estimated that a roadway 45 feet wide would require 250 tons of crude rubber per mile. Since about 21 pounds of crude rubber would be used in each square yard, its cost in such units, with rubber at 10½ cents, would be $2.20½.

CANADA

The proportionate sales of rubber and fabric galoshes this coming season is a question puzzling many Canadian shoemen. The estimated average for Ontario is 52 per cent rubber to 48 per cent fabric; while it is believed that fabric will predominate in the province of Quebec. But the average for the Dominion is 51 per cent rubber to 49 per cent fabric.

It is reported that dealers in the Maritime provinces have enjoyed a phenomenal run during the last three or four months on sneakers because of weather conditions. The increased business, however, has not brought much profit to the retailer as the margin leaves little room for profit. Incidentally the same is more or less true of all rubber goods; every one is trying to see how cheap he can sell them.

English manufacturers are making a new combination "Spring and Fall" raincoat of checked tweed material on one side and rubberized or proofed material on the other. The coats are reversible. They are said to be selling well and will compete with the long-popular gaberdine.

Rubber goods manufacturers have issued their booking prices on garden or lawn hose for the 1931 season. No changes were made in prices or datings and terms from those in effect during the past season. Garden hose is now being sold by Canadian Companies in 50-foot lengths, wrapped, and provided with or without couplings, as well as in the reels, as formerly.

A decline is reported in red rubber packing. No. 1 grade in sheets is now quoted at 34 cents a pound, and No. 2 grade in sheets at 27 cents a pound.

The changes in the Canadian Customs Tariff do not affect the rubber industry. For rubber hose, cotton hose lined with rubber, etc., in a tariff item have the unchanged rates of 20, 30, and 35 per cent. The purpose of the new tariff apparently was to single out rubber clothing and clothing made from waterproofed cotton, on which a special provision was made for increased duties.

Dominion Rubber Co., Ltd., Montreal, P. Q., through President W. A. Eden announced the following organization changes: George Bergeron, general manager, Columbus Rubber Co. of Montreal, Ltd.; W. M. Carment, general manager, Mechanical Sales; G. W. Charles, general manager, Footwear Sales, including Ames Holden, Columbus & Felt Co.; E. J. Dempsey, general manager, Footwear and Mechanical Manufacturing. Mr. Dempsey will have jurisdiction also over manufacturing at the Felt company. John Myles, well-known in the rubber footwear trade, has been appointed general manager of the distributing branches of the Dominion company with headquarters at Montreal. For the last eleven years Mr. Myles was with Columbus Rubber Co. of Montreal, Ltd., of which he was manager. On the eve of assuming his new duties Mr. Myles was tendered a complimentary dinner at which he received a gold watch and chain, presented by Columbus officials, foremen, and managers, and also an onyx desk set from the girls of the office staff. W. A. Trail, of the Dominion company, was elected treasurer of the Canadian Purchasing Agents' Association at its recent tenth annual convention held in Hamilton, Ont.

Imperial Oil, Ltd., Toronto, Ont., announced that stocks of tires and tubes were established in Ontario service stations of the company during October and as soon as possible will be made available to garages, dealers, and service stations elsewhere in Canada. It is stated that Atlas tires and tubes will be made in the Dominion and will be guaranteed by Imperial Oil, Ltd., with a twelve months' guarantee on passenger car service and six months' on commercial car service.

W. H. Miner, president of Miner Rubber Co., Ltd., Granby, P. Q., with Mrs. Miner recently celebrated their twenty-fifth wedding anniversary and were presented by officials and other employes of the Miner company with a solid silver salver, suitably inscribed. Mrs. Miner was given also a bouquet of twenty-five American beauty roses. Both Mr. and Mrs. Miner made suitable replies expressing their appreciation.

Kaufman Rubber Co., Ltd., Kitchener, Ont., made the following changes in its selling staff: Jim Birss has been appointed manager of the firm's Ottawa, Ont., branch; A. F. Stilwell has been put in charge of the St. John, N. B., branch; F. M. Downs has joined the selling force at the Ottawa branch; and J. C. McLeod now carries the Kaufman line in the Cobalt and Rouyn territory.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont. Sir John G. Beharrell, managing director of the Dunlop Rubber Co., England, recently inspected the Canadian Dunlop plant, accompanied by E. B. Germain, president of the Dunlop Tire & Rubber Co., Buffalo, N. Y., U. S. A. A. E. Mann, formerly on the sales staff of Seiberling Rubber Co., of Canada, Ltd., Toronto, Ont., recently joined the Dunlop sales department.

Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., gave a luncheon at the plant for the convention of the Purchasing Agents Association of Hamilton and District. E. W. BeSaw, the Firestone president, thinks that within a few years executives of every large company in Canada will use airplanes in their business. He is a firm believer in the future of aviation, particularly in Canada, where the great distances and the inaccessibility of northern districts make the airplane an invaluable means of transportation. Mr. BeSaw hoped that the recent visits of the Firestone plane to various Canadian cities would help to impress upon the people the need for developing airports and air-mindedness.

H. F. Davidson, a member of a German manufacturing firm of Berlin, while in Montreal the past month said that the new Canadian tariff will meet with no favor in Germany. In fact it is liable to provoke reprisals. Canada has had a valuable export trade in manufactured articles to Germany, especially rubber goods and motor cars, which she may lose as a result of the tariff changes which strike hard at German exports.

"You may rest assured," Mr. Davidson declared, "that we will arrange to buy from those who buy from us."

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont. In statement accompanying current dividend checks C. H. Carlisle, Goodyear president and general manager, declared that the annual statement for fiscal year ended September 30, to be issued shortly, will reveal that after writing down inventories to current market value, the lowest in the history of the rubber industry, the company will be in a position to add to surplus account. Speaking of operations, Carlisle says earnings will not be comparable to those of normal years because of conditions in the industry. Recently for the first time in history newspapers were lifted from the roof of the building in which they were printed and delivered to a distributing point in a non-stop flight of an airship. The distributing point was Toronto, and the airship was the Goodyear "Defender," largest of the Goodyear fleet. Charles Watson, of the Goodyear company, as immediate past president of the Advertising and Sales Round Table of Toronto, at its recent annual meeting was elected a member of the new Executive Committee.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
*†47,746	Vulcanizing material and tire repair patches.	Prague, Czechoslovakia
†47,756	Toys, balloons, bathing caps, etc.	Angouleme, France
†47,784	Tires	Turin, Italy
†47,814	Tires and tubes	Oporto, Portugal
†47,817	Toy balloons	Colombo, Ceylon
†47,833	Canvas shoes and overshoes	Berlin, Germany
†47,872	Druggists' sundries	San Juan, P. R.
†47,884	Bathing caps, aprons, shoes, and baby articles	Mexico City, Mexico
†47,885	Hospital sheeting	Rio de Janeiro, Brazil
†47,886	Galoshes, arctics, and raincoat material	London, England
‡47,887	Belting and canvas fire hose	Ahmedabad, India
*†47,899	Tires	Jedda, Arabia
†47,933	Transmission belting	Turin, Italy
†47,936	Tires and tubes	Toulouse, France
*†47,948	Hospital and surgical sundries	Montreal, Canada
†47,976	Technical goods	Berlin, Germany
†47,977	Rubber goods	Vienna, Austria
†48,006	Tennis and golf balls	Sutton, England
†48,030	Druggists' sundries	Shanghai, China
†48,032	Sport goods	Habana, Cuba
*48,035	Tires	Vercelli, Italy
†48,048	Tires and inner tubes	Barcelona, Spain
†48,083	Industrial hose and transmission belting	Sale, England
†48,113	Footwear	Sale, England
†48,134	Tennis shoes	Milan, Italy

* Purchase. † Agency. *† Purchase and agency. ‡ Either.

The Rubber Industry in Europe

GREAT BRITAIN

Fixing Tire Prices

The Government Committee on Restraint of Trade, recently appointed to consider present trade practices, now has before it the India Rubber Manufacturers' Association evidence regarding the tire section of the rubber industry, which is the best organized branch of the rubber trade as far as control of sales is concerned. There are in the United Kingdom eleven leading tire factories, which supply 95 per cent of the tires, and these, in addition to others who import tires, have practically uniform distribution conditions.

While fixed prices are insisted on for both jobbers and retailers, these prices vary for different manufacturers and are not fixed by combines or associations. Wholesalers or retailers are not obliged to confine purchases to given manufacturers or associations, and without known exception tire manufacturers supply their products to any wholesaler or retailer who will give proper service. Manufacturers are aided in maintaining fixed prices with the help of the Motor Trades Association.

Since it is felt that tire service and supply must be available at every point at which cars or other motor vehicles exist, there is no such thing as a distance limit policy included in the method of distribution.

Stabilizing Prices

The stabilization of prices is not only a protection to manufacturers, but is a distinct advantage to the public, for fixed prices insure continuity of demand and therefore an even rate of production and maintenance of quality. Irregular demand and uneven production necessitate periodic discharge of employes or increased costs of production, if not both. On the other hand, where prices are stabilized, competition among retailers must take the form of service and enterprise; these policies also are to the advantage of all concerned, manufacturer, seller, and consumer.

Advice to Producers

The Rubber Growers' Association has sent a circular to its members suggesting a method of procedure in view of the Dutch East Indian Government's rejection of restriction proposals.

"It will be evident," says the circular, "that until the decision of the Dutch East Indies Government, as recently announced, is reversed, no useful purpose can be served by this association giving further consideration to any proposals for the compulsory regulation of rubber supplies. The Council of this association desires to bring to the attention of its producing members certain considerations which should weigh with them in deciding upon the action now to be taken.

"It is well known that consumption has been severely curtailed by the existing widespread economic depression, and current production is consequently well in advance of requirements. As long as these conditions prevail, a reduction in costs in so far as it is dependent on the maintenance of full outputs, cannot bring any amelioration to the situation since such reduction will inevitably be nullified by a further fall in the price of rubber.

"Economic production must therefore be sought along other lines. The main consideration of all producers is to limit, as far as practicable, the excess of expenditure over income. If that excess is not likely to be increased by so doing, then producers should not hesitate to suspend tapping entirely.

"Where it is decided that production should be continued, it should not be too readily assumed that losses will be best curtailed by maintaining production at the maximum volume. Since at present prices the production of every pound of rubber entails a loss, a contraction in output may in many cases result in minimizing the loss, the more so since the reduced volume can be taken off the most productive areas at a lower operating cost. The bringing of young rubber to tapping should be postponed. Older areas which from one cause or another are giving only small yields should be put out of tapping."

Institution of Rubber Industry

A meeting of the London and District Section of the Institute of the Rubber Industry was held in the Arts Theater Club, London, on October 6, when a paper on "The Desirable Properties of Synthetic Compositions for Industrial Purposes" was read by W. D. Owen.

Leyland & Birmingham

The report for the past business year of the Leyland & Birmingham Rubber Co. showed that the trading profit amounted to £67,649, which with £33,696 brought forward from the preceding year makes a total of £101,345. A dividend of 7½ per cent was declared, and a balance of £28,301 15s. 3d. was carried forward.

While the output from the Leyland works during the year showed an increase over the previous year as far as weight is concerned, the turnover in sterling was less. This decrease was caused by the fact that since the large additions to buildings, plant, etc., of the Leyland works require a very large volume of trade to keep them going to capacity, many orders had to be taken at prices leaving hardly any profit to speak of, for it is disastrous to run the big departments at Leyland at 50 or even 75 per cent of their capacity.

The Leyland company has taken a £30,000 interest in the British Moulded Hose Co., formed to manufacture molded and braided hose. This company has a capital of £200,000, of which £100,000 are in common shares and £100,000 in 7 per cent cumulative preferred shares. The Electric Hose & Rubber Co., Inc., of Wilmington, Del., U. S. A., guarantees the preferred dividend as to seven-tenths, and the Leyland company the remaining three-tenths.

The chairman explained that the Leyland company had had a complete plant for the manufacture of this class of hose but could not sell in sufficiently large quantities to make a really satisfactory profit. When, therefore, the Electric Hose & Rubber Co. approached Leyland inviting it to join in forming a company to manufacture this hose in England, the proposition was accepted. The company was fortunate in acquiring a very fine freehold property at Watford near London, on most favorable terms, and has equipped it with the latest and best plant and machinery. The plant and the machinery which the Leyland company had were taken over by the British Moulded Hose Co., Ltd., on very favorable terms.

Goodyear Fire

The three-story tire warehouse of the Goodyear Tire & Rubber Co. in Birmingham, in which several thousands of tires were stored, was completely destroyed by fire. The total loss is estimated at about £100,000.

Jugo-Slavia

The Jugo-Slavian rubber industry is a very recent development and boasts but two factories of any importance besides three much smaller establishments. The larger works, each of which employs some 150 persons, are the Vulkan Gummiwaren-Fabrik G.m.b.H., in Kranj, founded in 1921 and producing technical rubber goods, heels, and erasers; and the so-called First Jugo Slavian Rubber Goods Factory "Rekord," Josip G. Culjkovic, in Leskovac, which, however, was not started until 1925, and manufactures footwear, heels, soles, rubberized cloth, and technical goods.

Of the three smaller firms, Sanitas, in Belgrade, actually deals in sanitary and cosmetic goods, but makes rubber corsets and belts as a sideline; the Anker, recently established, makes rubber goods and toilet accessories; and the Elasticum, M. Rosner, supplies rubberized fabrics. In addition to these, a First Serbian Rubber Goods Factory has just been founded. The "Fit" works, at Belgrade, for vulcanizing automobile rubber, should also be mentioned.

The factories mentioned cannot supply all of Jugo-Slavia's needs in regard to rubber goods, and a certain amount is therefore imported, chiefly from Germany, Austria, and Hungary.

GERMANY

General Price Cut

In hope of improving economic conditions, the German government is asking for a general price reduction on all commodities. The state railway department has warned the supply houses that orders would no longer be placed with them if prices were not reduced.

As far as the rubber trade is concerned, many are considering the movement untimely, especially in the technical and surgical goods branches where sharp competition and underselling among dealers have been the order for a long time, resulting in several lines having prices already cut to the minimum. Dealers are anxious to secure even small orders, and the fear of losing a customer is such that dealers too frequently are willing to reduce prices and extend credit. Hose of various types for different purposes, packing, jar rings, washers for bottles and mats are causing dealers much concern for sales are slow and prices obtained quite inadequate.

Protective Garments

The situation is somewhat better in other products as rubber rollers, press cloths, protective clothing, and It packing.

With regard to garments and accessories designed to protect the worker, it is interesting to note that the business here is constantly improving. Industrial hygiene is making considerable headway, and interest is growing in all types of protective clothing and devices, be they footwear, gloves, suits, coats, aprons, inhalers, or gas masks. To be sure, it is also true that new working methods as autogenic and electrical welding, color spraying and sand-blasting have made protection for the workers a necessity.

Belting Inactive

The business in driving belts has been very quiet for some time now primarily because more attention is being paid to direct drives and, in certain fields, to V belts. Those interested have recently met, and preliminaries have been discussed with the end of launching a cooperative propaganda campaign for driving belts.

Tire Sales Disappointing

The stagnation in many important industries as coal, iron, machinery, building, etc., which, for instance, in the case of the trades supplying builders has forced output to be curtailed to about 50 per cent, has affected other departments of the rubber industry besides the mechanical goods.

Thus we learn from a report of the Chambers of Commerce and Industry for the district embracing Frankfurt a.M.-Hanau-Fulda, Wiesbaden, Dillenburg, Limburg, and Wetzlar, that the reduced purchasing power of consumers and the idleness in the building trades have affected the tire industry so that the hoped-for improvement in sales of truck tires did not materialize. Tires for motorcycles and bicycles were in more active demand, but on the whole the situation is not satisfactory.

With regard to the cut in tire prices, a large number of German tire factories will, as from October 1, 1930, cut prices for tires for passenger cars by 5 per cent and for trucks (giant pneumatics and cushion tires) by 10 per cent.

This action has been taken in compliance with the government's movement toward lower prices, as the manufacturers concerned do not wish to leave anything undone that might tend to increase the demand for their products.

Englebert's New Factory

The tire factory recently established by Englebert & Co., G.m.b.H., at Aachen, a branch of the Belgian firm, is now in operation. The output includes tires for automobiles, motorcycles, and bicycles.

New Types of Belts

Belts used for feeding material to machine tools, particularly wood polishing machines, are usually built up of rubber with fabric inserts, the surface having depressions running across the width of the belt. In these belts the friction between the material and the rubber makes it possible for the material to be carried along. The Continental Gummiwerke A.G., Hannover, A.G., has patented a belt for the above purpose in which the grooves in the rubber are so designed that a certain suction action is exerted on the material to be conveyed.

A new method of producing the belts is also followed. The usual practice was to make the belts in straight lengths, emboss, and then join them, resulting in making the joint a decidedly weak spot in the belt. By the new process the belts are made endless to begin with and then embossed in a press having two plates placed one over the other which carry the design. To insure that the design in the lower plate runs parallel to that of the upper plate, the lower is supplied with guide rails which permit necessary adjustments.

The belt is inserted between the two plates, which are set so that only the part of the surfaces of the belt between the plates is first embossed; then the press is opened, and the plates readjusted to handle the rest of the belt, perfect continuation of the design being effected with the help of small fitting staves which are used to fill in the depressions at the ends of the plates.

This firm has also designed a conveyer belt with wire band inserts placed at definite intervals and passing through the length of the belt, while strips of cord webbing running in the opposite direction hold the belt together.

The Franz Clouth Rheinische Gummiwarenfabrik A.G., Koln-Nippes, makes a conveyer belt of rubber or balata with fabric inserts designed for conveying oily materials. It, therefore, has on its surface one or more protective layers of a cellulose substance. These cellulose layers are united with rubber and fabric to form a thin, easily removable cover.

The difficulties encountered in applying a liquid or solid anti-slipping agent to belts, especially those of large dimensions, have been overcome by H. Rost & Co., manufacturers of gutta percha goods and balata belts, at Harburg-Wilhelmsburg, which firm has developed a process by which the anti-slip agent can be sprayed onto the belt. By this means belts of any size can be uniformly coated as desired.

FRANCE

Rubber Trade

Examination of statistics of France's rubber trade during 1929 reveals that the downward tendency of exports, already observed in 1928 and continued in 1929, when values showed a decline of 23 per cent as compared with results of the preceding year. In fact, France now exports less rubber goods than Germany and Canada and has consequently lost her position as a leading exporter of rubber goods.

While in 1928 the total exports were 33,982 tons, value $32,379,827, the figures for 1929 were 27,769 tons, value $24,917,-166. On the other hand, imports, which were 6,316 tons, value $5,880,157, rose to 6,839 tons, value $7,864,304, in 1929.

In connection with the growing imports of rubber goods into France it is worth noting that whereas formerly it was practically impossible to introduce foreign tires into France because of the high import duties and the preference shown for local products, various foreign firms have in recent years succeeded in establishing themselves in the French market. Thus the German firm Continental is said to be gaining ground in France.

The cause of the weakened position of the French rubber manufacturers regarding exports is their products have become more expensive as a result of higher costs for wages, freight, transportation, etc., making it impossible for them to compete successfully with many foreign countries. In the tire trade the United States and Canada are France's most important competitors.

New Company

Industrie du Caoutchouc Souple, a new French firm, with headquarters in Paris, has just been formed to manufacture and trade in tires and all kinds of rubber goods. The firm has a capital of 5,000,000 francs, divided into shares of 1,000 francs, all fully subscribed. The first directors are Henri de la Mathe, Giuseppe Venosta, Antonio Albertini, Gaetano Barucci, Gabriel Bonnet, Louis Jaudeau, and Raoul Orefice.

Activated Carbon

In addition to the two processes for manufacturing activated carbon referred to in these columns, September 1, 1930, page 78, mention should also have been made to the patented processes of "Société de Recherches et d'Exploitations Pétrolifères," Paris, France. This company's methods are characterized by the fact that the activated carbon obtained contains no chemical constituents which might entail any inconvenience.. These carbons have proved their great efficiency in numerous plants in Europe, for various industrial purposes including solvent recovery.

The Rubber Industry in the Far East

MALAYA

Producers' Crisis

Assured that they have nothing to expect from the government in the way of legislation to help the industry, rubber producers are settling down to the painful task of taking stock of themselves and devising means best suited to their individual needs. In some cases the decision has been that the best policy is to close down temporarily; in others selective tapping with the help of the most skilled tappers is the solution; while in a certain number of hopeless cases offering the estates for sale is being considered.

All this is not taking place without bitter criticism of the governments concerned and of the strong companies who favor this way out of the difficulty. The direst results are predicted unless restriction is enforced as soon as possible. Letting the law of the survival of the fittest take its course will cause a large number of estates to go into bankruptcy, dislocation of the machinery of the industry, and widespread distress. Some predict that consumers will have to pay for this by being faced with a severe shortage at the time when they need supplies. Others cannot see that bankruptcy of the weak estates will lead to reduced outputs, for these estates will be bought at bankrupt prices and will go on producing more rubber than is required, and the industry will never see a prolonged period of prosperity again.

Supply and Demand

The talk of the theories of supply and demand and the natural laws governing these is puerile, they say. What is needed is control of supply. But have the laws of supply and demand been allowed to work in the case of rubber? Leaving out of consideration the period of the restriction scheme during which the unduly high level of prices bolstered up weak companies, encouraged native planting, and generally befogged the situation so that neither producer nor consumer knew exactly where he was, let us turn to the period of falling prices succeeding the removal of restriction. The companies, especially the weak ones, finding themselves without a prop, became panicky, and the faster prices fell because of the ill-considered dumping of rubber on the market, the faster the weaker companies rushed to dump yet more rubber and to make forward contracts at unprofitable prices. When rubber quotations had fallen to a price level already dangerously low, but still several pence above present rates, some concerns came to their senses and prepared to restrict their own outputs voluntarily, with every prospect that others would follow their lead and thus halt the downward trend of prices. But unfortunately, just at this moment, prospects of renewal of restriction seemed to be more certain than ever, and production to the limit was again the order of the day. Have we not here a plain case where the beneficial working resulting from consideration of the laws of supply and demand was frustrated by the prospect of restriction?

Ills of the Industry

The industry suffers from several ills: first, as the Governor, Sir Cecil Clementi, put it, it is young and has never known a normal period so that the right level of prices and costs has yet to be found; too many estates are over-capitalized, poor yielders, and far too expensive producers. The latter cause all the trouble, be they European or Asiatic. Finally, there is underconsumption; the world is passing through a severe economic crisis and at present cannot use much more rubber at any price.

Restriction as a Remedy

This being the case, restriction cannot be called a cure; it is worse than a palliative; it is a narcotic that renders the industry insensible to the true facts of the situation and in relation to the rest of the world. Like a narcotic, restriction is required again and again and in ever larger doses if it is to produce the desired effect.

But there is more. With heavy stocks on hand and world-wide depression, a new period of enforced restriction will scarcely be accompanied by a new era of high prices for the commodity. A certain rise in prices might be attained, probably just enough to stimulate production and planting where it is least desired, but hardly much more. In addition, where consumers daily read of well-run estates producing at 5d. per pound and even 4d. with prospects of still further reductions when the budded areas begin to produce, it may be taken for granted that they will not consent to pay for rubber at a rate which in effect constitutes a subsidy to estates unable to produce at less than 10d. per pound.

And let us ask, what would become of these high-cost estates if they were saved now, then had to face the struggle all over again on a more intensive scale than ever five or ten years hence, especially as an increasing number of estates are tapping their budded areas at very low costs while they are still at their old high level? For it may be taken for granted that if these expensive producers were not able or willing to take advantage of the last period of good prices to plant budded rubber, they will hardly be in a position to do so now.

The Native Rubber Bugaboo

Again the bugaboo of the industry is said to be native rubber, particularly Dutch native rubber. If the estates wish to see the terror descend on them in earnest with native rubber supreme, restriction and artificially bolstered prices will do the trick in a shorter time than they think possible.

Survival of the Fittest

Left to themselves, efficient European producers will find their way out of the difficulty; they will be stimulated to exert themselves and will find new ways and means of meeting the situation. Incidentally, the proper level of costs and price will be found. The dropping out of estates will not be on so large a scale as some expect because, as an examination of reports of companies will show, the majority are in good financial condition. On the other hand, in view of the large stocks and the world-wide depression, there is no real need to fear a shortage from under-production. When demand increases, as the world condition improves, the flush yields from rested rubber together with the large stocks will cover the immediate demand.

As for the fear that weak estates will be bought at bankrupt prices and the rubber obtained from them will depress the market, this seems to be equally unfounded. With two bad slumps as a warning, and a higher standard of efficiency and productivity required on estates, together with the possibility of a smaller margin of profit in the future, it does not seem likely that careful investors will be tempted to buy known poor-yielding estates for rubber exploitation, though there is a likelihood that such estates might be bought, if cheap enough, for experimenting with new crops

It seems equally improbable that seasoned investors will buy up estates having poor soil, for the purpose of replanting them with budded material. It must be borne in mind that while a moderate yielder may become a high yielder under favorable conditions of soil, etc., a high yielder will deteriorate in this respect if placed in unfavorable conditions. That otherwise good estates may be bought up for further rubber production is, of course, to be expected.

New Plantings

It may be argued that the shortage which has just been denied would be favored by the diversion of weak estates to other crops. This would be true if progressive planters had not been planting up budded and selected material, if strong concerns were not even now waiting for concessions of virgin land in the largely underdeveloped province of Pahang. Thus the Sedgeley Rubber Co. has applied for 1,500 acres in Pahang for new and improved planting, and both the Jeram and the Nyalas concerns have recently acquired interests in the Sungei Chermiang Rubber Co., which is planting up a block of land in Pahang on the most modern lines.

A Breathing Space

Should, as a result of the policy of letting natural laws take their course, prices continue to be low for a while longer, this condition, by discouraging excess production and new plantings by the natives, would give the sound European estates that breathing space they require in order to

get their new plantations of high yielding material to maturity and to extend them with the view of maintaining themselves in a struggle with the natives for supremacy in the rubber industry.

Rubber Paving

At a meeting of the Municipal Commissioners of Singapore, it was decided that in view of the fact that the estimated cost of rubber paving is 10 times that of asphalt paving, the Rubber Growers' Association be asked whether they are prepared to give free of cost the rubber that would be required for the proposed experimental paving at Read Bridge.

The Penang Municipality has appropriated $25,000 (Straits Currency) for experimenting with rubber pavements in its districts.

NETHERLANDS EAST INDIES

Native Rubber Exports

The Netherlands Indies Rubber Trade Association has sent its members some figures regarding native rubber exports during the first six months of 1930, taken from data compiled by the Central Bureau of Statistics. The total amount of exports from all the outer provinces came to 69,676 tons in the first half of 1930, a decline of about 4,000 tons as compared with the totals for the same period of 1929, when the figure was 73,793 tons. It appears, therefore, that despite the great difference in price the average price of Java standard crepe in June, 1929, was 54.9 cents against 31.25 cents in June, 1930, and in spite of the May tapping holiday, output from native areas did not show so large a reduction as expected.

The decrease was due to the falling off in shipments from six provinces in which districts the natives do not depend upon rubber for their maintenance. The declines for the individual provinces are as follows: Tapanoeli, 40 tons; East Coast Sumatra, 2,400 tons; Riouw, 1,100 tons; Palembang, 1,900 tons; West Coast of Sumatra, 200 tons, and Bangka, 400 tons; in all about 6,040 tons.

Against this must be put increases of 2,390 tons, leaving the net decline at under 4,000 tons. The provinces from which increased shipments were recorded were Atjeh, about 40 tons; Djambi, 340 tons; South and East Borneo, 460 tons; West Borneo, 1,550 tons.

Finally the figures reveal the fact that even under present adverse circumstances, Djambi, South and East Borneo, and West Borneo each continue to ship regularly between 2,000 and 3,000 tons a month.

Conditions in Djambi

How long these high outputs, especially from Djambi, will continue, is extremely doubtful. Reports state that owners of larger holdings, who have to employ tappers to work for them, have closed down. An official from Djambi visiting Batavia reports that some owners are so spoiled by their past prosperity that rather than save costs by doing tapping themselves, they submit to the demands of their tappers, who insist upon two-thirds of the crop as their share, instead of one-half as before. It seems that a number of owners have let their holdings to tappers for a small fixed consideration. Fair-sized gardens, with some hundreds of trees in them, at this rate do not yield their owners more than 20 guilders a month.

The same authority says that after much difficulty natives have been persuaded again to take up the cultivation of rice to a certain extent; in a few cases they have even cut out rubber trees to make place for rice. An agricultural expert has arrived to give advice regarding rice cultivation. Djambi has some good timber in its forests, and the possibilities of profitably felling these trees are being investigated. If these measures help to wean the native from his predilection for rubber cultivation, the time and effort expended will have been well worth while.

Native Outputs

The *Deli Courant* points out that with all said and written about the native menace, it is noteworthy that the actual native output in Malaya is higher than in the Dutch East Indies.

The statistics from Malaya show no difference between output from Malayan estates or from Malayan native holdings. But the outputs from estates of more than 100 acres are given. Holdings of less than 100 acres are mainly native-owned, and it is easy to figure out the native outputs. Thus for the first four months of 1930 the output from Malayan estates was found to be 77,392 tons, and from native holdings, 71,111 tons, or in all 148,503 tons. The proportion of native rubber compared with the total was, therefore, 48 per cent. For the same period the Netherlands East Indies figures were: estate rubber, 51,988 tons, and native rubber, dry equivalent, 33,634 tons, or a total dry equivalent of 85,622 tons, the share of the natives being 39 per cent.

Unvulcanized Tires

It is announced in the local press that after much experimenting C. A. Ilcken, chemical engineer, has succeeded in producing inner tubes from unvulcanized rubber.

The press statement is not quite clear. After saying that the patent referred to inner tubes, it states that the invention, for which Ilcken and C. J. van der Sloot, of Bandoeng, have applied for patent, consists of a method of producing both tubes and casings from sheets of rubber obtained from latex coagulated together with reenforcing material.

Penal Sanction

A bill is before the Netherlands East Indies Peoples' Council to abolish the system of penal sanction in all the Outer Provinces, including Sumatra and Borneo. It provides that all plantations opened during or before 1921 will have to show 20 per cent of free laborers by January, 1932; 30 per cent by January, 1934, and 50 per cent by January, 1936.

Plantations opened between 1922 and 1927 will have to show the same percentage on January 1 of the eleventh, thirteenth, and fifteenth year of their existence; while recent plantations, that is those opened from 1928 to 1930, must have 50 per cent of free laborers on January 1, 1942.

N. E. I. Notes

The Goodyear Rubber Plantations Co. has taken over the concession Slepan and part of the Aloer Gadoeng concession.

The Java Caoutchouc Co., which had announced that tapping would cease after January 1, 1931, now states that by enforcing drastic economies the cost has been reduced to about 5d. per pound, at which price it becomes more advantageous to continue tapping than to stop. In consequence of a forward contract covering the greater part of the crop for a period of 15 months, it has, therefore, decided to continue tapping for the time being.

The Anglo-Dutch Plantations of Java, Ltd., has given instructions to stop production on the estates outside the original Pamanoekam and Tjiasem Lands. The crop from these estates on a full year's production is in the neighborhood of 3,000,000 pounds.

The Belgian Netherlands Plantation Co. suspended tapping on the Tjimatis estate in Java and on the plantations of Sindanglaka and Pasir Bogor. About 50 to 70 per cent of the native labor force has been dismissed and only the necessary upkeep of the plantations is being maintained. On the government rubber plantation at Serpong in the same district one-third of the coolies will be dismissed shortly.

Soengei Simoedjoer, belonging to the large Arendsburg tobacco company in Sumatra, will restrict tapping to the most remunerative areas. Owing to the fact that surplus labor can easily be transferred to the tobacco plantations, cessation of tapping can take place easily.

CEYLON

The following committee has officially been appointed to watch the rubber situation and to make recommendations to the government: The Controller of Revenue (Chairman), H. A. Burden, C. W. Bickmore, the Hon. M. J. Cary, Hon. D. S. Senanayake, Hon. C. H. Z. Fernando, J. A. Tarbat, F. F. Roe, Neville Rolfe, F. H. Griffith, Wace de Niese, and Major Scoble Nicholson.

A significant remark was made by a local planter when interviewed regarding the present rubber crisis. If the rubber situation did not improve within two years, he thought that some other product would have to be planted instead. The point is, how many more rubber producers think so too?

The *Ceylon Observer,* commenting editorially on the rubber debacle, says:

"A tendency exists to blame the small holders for the indiscriminate planting of rubber, regardless of economic consequences. But the same charge can be laid with greater justification against the large capitalists. The pressure brought to bear upon the government to alienate land for tea and rubber plantations by capitalistic concerns has had to be fought against in

(*Continued on page* 111)

Patents, Trade Marks, and Designs

Machinery

United States

1,774,453.* **Dipping Apparatus.** This invention provides an apparatus for dipping and forming rubber articles, such as nipples, gloves, etc., in which the forming and drying operations are performed in a continuous operation. P. A. Raiche, Providence, R. I.

1,776,017.* **Rubber Washer Applicator.** This apparatus is for forming an external rubber washer upon a metal valve member such as those adapted to be mounted detachably within the valve stem of a pneumatic tire and provided with an external rubber washer. A. E. Bronson, assignor to Dill Mfg. Co., both of Cleveland, O.

1,776,141.* **Adhesive Tape Machine.** By this invention an adhesive compound is applied by calender to one side only of an endless master fabric. A sheet of paper is pressed in contact with the adhesive surface of the fabric. The master fabric is then exposed to the action of a solvent permitting the adhesive to be transferred to the paper unaltered in character, thus forming a low cost adhesive tape principally used in elaborate and complex painting operations. C. H. Bibb and G. S. Mathey, assignors to Johnson & Johnson, all of New Brunswick, N. J.

1,776,145.* **Tire Mold.** This eliminates the necessity of cutting a design in the mold. The main portions of the mold can be used indefinitely and the tread portion can be renewed at will. All of this is accomplished by sectional die-cast aluminum or aluminum alloy matrices of novel construction and arrangement in the mold to provide a minimum of seams or joint surfaces. G. W. Bungay, Plainfield, N. J., assignor to Aluminum Co. of America, Pittsburgh, Pa.

1,776,227.* **Assembling Machine.** This machine is of strong and simple construction, designed to select and feed gaskets into caps with greatly minimized labor over hand methods of doing the same work, and packing them into cases. F. G. Wieland, Woodhaven, assignor to Anchor Cap & Closure Corp., Long Island City, both in N. Y.

* Pictured in group illustration.

1,773,810. **Mold Valve Stem Locker.** W. L. Fairchild, New York, N. Y.

1,774,910. **Dispersing Solids in Liquids.** W. H. Whatmough, London, England, assignor to Standard Products Corp., New York, N. Y.

1,775,033. **Elastic Fabric Knitter.** R. J. Wilkinson, Pawtucket, R. I., assignor to Ribelastic Co., Needham Heights, Mass.

1,775,080. **Tire Builder.** W. F. Koleta, Akron, O.

1,775,626. **Collapsible Tire Building Core.** E. G. Templeton, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,775,646. **Composition Flooring Apparatus.** J. B. Losey and W. R. Stone, both of Syracuse, N. Y.

1,775,812. **Mold.** W. F. Church, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,776,037. **Tire Spreader.** S. Leavitt, Worcester, Mass.

Dominion of Canada

303,302. **Tire Vulcanizing Mechanism.** W. B. Burke, E. Cleveland, O., U. S. A.

303,456. **Elastic Fabric Device.** Moore Fabric Co., Pawtucket, R. I., assignee of C. T. Hawley, Holden, Mass., both in the U. S. A.

303,837. **Conduit Builder.** Goodyear Tire & Rubber Co., assignee of E. W. Bruce, administratrix of the estate of N. G. Bruce, deceased, and L. H. Gladwin, all of Akron, O., U. S. A.

303,900. **Rubber Mill.** P. E. Welton, assignee of W. H. Lockert, both of Cuyahoga Falls, O., U. S. A.

304,013. **Tire Casing Apparatus.** Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of H. Willshaw, Birmingham, both in England.

304,198. **Vulcanizing Apparatus.** Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of H. Willshaw and W. G. Gorham, both of Birmingham, all in England.

United Kingdom

330,953. **Rubber Mixer.** F. Kempter, Stuttgart, Germany.

331,073. **Bead Setting Apparatus.** Dunlop Rubber Co., Ltd., London, H. Willshaw and T. Norcross, both of Fort Dunlop, Birmingham.

331,187. **Boot Vulcanizer.** Liverpool Rubber Co., Ltd., F. Amende, and T. R. Dibdin, all of Walton, Liverpool.

331,415. **Ball Printing Machine.** F. A. Lovegrove, Halifax, Nova Scotia, Canada.

331,483. **Tire Cover Builder.** Firestone Tire & Rubber Co., Ltd., Brentford, Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

331,594. **Fabric Rubberizing Machine.** Firestone Tire & Rubber Co., Ltd., Brentford, Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

331,625. **Tennis Ball Mold.** Dunlop Rubber Co., Ltd., London, H. Willshaw and S. N. Goodhall, both of Fort Dunlop, Birmingham.

331,691. **Joint Packing Machine.** W. Cockle, Bardsley, Ashton-under-Lyne.

331,698. **Tire Vulcanizing Mold.** J. A. Spencer-Smith, Winnersh, Berkshire.

331,988. **Tire Mold.** Dunlop Rubber Co., Ltd., London, H. Willshaw and T. Norcross, both of Fort Dunlop, Birmingham.

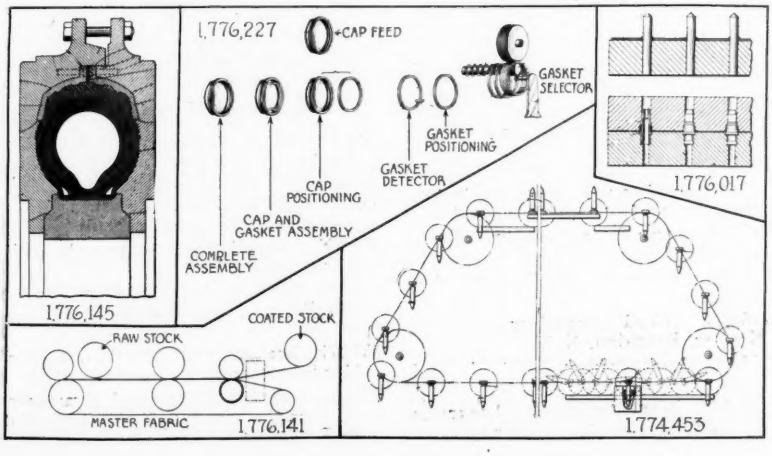
Germany

507,238. **Portable Vulcanizing Press.** Fried. Krupp A. G., Essen a. d. Ruhr.

Designs

1,134,250. **Securing Heels.** E. Hubner, Hamburg 23.

1,134,533. **Heel Securing Device.** P. Muller, Welkramshausen, Teichmuhle.



Process

United States

1,774,781. **Coloring Rubber Articles.** A. P. Witten, assignor of one half to G. E. Hall, both of Akron, O.

1,774,858. **Uniting Laminated Materials.** R. Vorbau, Oranienburg, near Berlin, assignor to Deutsche Gasglühlicht-Auer-Gesellschaft mit Beschränkter Haftung, Berlin, both in Germany.

1,774,907. **Manufacturing Dentures.** A. Stroe, Cleveland, O.

1,775,953. **Printer's Blanket.** G. L. Willson, New York, N. Y.

United Kingdom

330,874. **Pavement.** E. O. Cowper, S. Kensington, London.

330,944. **Electric Cable.** O. E. Buckley, Maplewood, N. J., U. S. A.

331,632. **Connecting Uppers to Soles.**

W. Evans and A. H. Lockton, both of Leicester.

Germany

506,110. **Rubber Tipped Laces.** A. Schoeler, Wuppertal-Barmen.

506,933. **Elastic Fabric.** W. Hussels, Wuppertal-Barmen.

Chemical

United States

1,773,724. **Variated Surface Effects.** J. B. Crockett, assignor to Cambridge Rubber Co., both of Cambridge, Mass.

1,774,322. **Accelerator.** B. S. Garvey, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,774,324. **Composite Product.** H. Gray, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,775,569. **Aqueous Rubber Dispersion.** W. B. Pratt, Wellesley, Mass., assignor, by mesne assignments, to Dispersions Process, Inc., Dover, Del.

1,775,621. **Composition.** F. Patee, Casper, Wyo.

1,775,985. **Accelerators.** S. M. Cadwell, Leonia, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

Dominion of Canada

303,423. **Accelerator.** I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of H. Lecher and W. Zieser, both of Leverkusen/Rhine, all in Germany.

303,468. **Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of W. Scott, Nitro, W. Va., both in the U. S. A.

303,547. **Accelerator.** S. J. Peachey, London, N. W. 3, England.

303,581. **Electro-deposition of Rubber.** Anode Rubber Co., Ltd., London, E. C. 2, England, assignee of F. Gabor and P. Klein, both of Budapest, Hungary, and A. Szegvari, Akron, O., U. S. A.

303,838. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

304,197. **Dispersed Rubber.** Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of W. H. Chapman, D. W. Pounder, E. A. Murphy, and F. T. Purkis, all of Birmingham, all in England.

United Kingdom

330,922. **Synthetic Rubber.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

330,949. **Coating Composition.** Imperial Chemical Industries, Ltd., London, R. Hill and E. E. Walker, both of Manchester.

330,970. **Latex Treatment.** Dunlop Rubber Co., Ltd., London, G. W. Trobridge and E. A. Murphy, both of Fort Dunlop, Birmingham.

330,981. **Water Curing Accelerators.** Rubber Service Laboratories Co., assignee of W. A. Moore, both of Akron, O., U. S. A.

331,197 and 331,227. **Porous Compositions.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

331,263. **Rubber Treating Leather.** C. G. Shaw, Huntsville, Ont., Canada.

331,265. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

331,563. **Electro-deposition of Rubber.** Dunlop Rubber Co., Ltd., London, D. F. Twiss and R. G. James, both of Fort Dunlop, Birmingham.

331,885. **Accelerators.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

Germany

506,207. **Coloring Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

506,677. **Solvent and Softener.** I. G. Farbenindustrie A. G., Frankfurt a. Main.

508,418. **Vulcanized Oil Masses.** D. Gestetner, Ltd., London, England. Represented by H. Heimann, Berlin S. W. 61.

General

United States

17,795 (Reissue). **Sectional Pavement.** A. F. Masury and A. H. Leipert, both of New York, N. Y., assignors, by mesne assignments, to Rubber Shock Insulator Corp., Wilmington, Del.

1,773,932. **Life Preserver.** H. A. Ayvad, West New York, assignor to Ayvad Mfg. Co., Hoboken, both in N. J.

1,774,060. **Firearm Cushion.** A. C. Hodge, Burbank, Calif.

1,774,153. **Tire Gage.** P. W. Pfeiffer, Syracuse, N. Y.

1,774,198. **Helper Spring Construction.** C. F. Drumm, Jr., assignor to International Motor Co., both of New York, N. Y.

1,774,613. **Elastic Corset.** R. A. Pidgeon, Needham Heights, Mass.

1,774,748. **Automobile Shoe Bead Reenforcement.** T. Gore, Brooklyn, N. Y.

1,774,815. **Vehicle Chain Track.** J. H. Robertson, London, England.

1,774,892. **Inner Tube.** W. A. Kline, assignor to A-R Products Corp., both of Akron, O.

1,774,949. **Suitcase Handle.** B. H. Shwayder, assignor to Shwayder Trunk & Mfg. Co., both of Denver, Colo.

1,774,990. **Self-Adjusting Radius Rod.** P. E. Matthews, Plainfield, N. J., assignor to International Motor Co., New York, N. Y.

1,775,008. **Tractor Wheel.** R. M. Waters, Haines City, assignor of one half to J. L. Myers, Sebring, both in Fla.

1,775,115. **Flexible Engine Support.** E. H. Belden, assignor to Willys-Overland Co., both of Toledo, O.

1,775,249. **Vehicle Center Bearing.** G. Q. Lewis, Wheaton, assignor to W. H. Miner, Inc., Chicago, both in Ill.

1,775,278. **Roadway.** L. Gaisman, Audenshaw, near Manchester, England.

1,775,282. **Renewable Bearing.** A. G. Johnson, Lincoln, Nebr.

1,775,392. **Roller.** C. H. Gray, London, England.

1,775,400. **Fluid Container.** L. H. Kramer, Brooklyn, N. Y.

1,775,403. **Swab Rubber.** L. M. McLeod, Tulsa, Okla.

1,775,442. **Hot Treatment Apparatus.** D. Sarason, Munich, Germany.

1,775,509. **Girdle.** S. H. Camp, Jackson, Mich.

1,775,556. **Universal Joint.** F. B. Hewel, Pittsburgh, Pa.

1,775,629. **Tire Alarm Switch.** W. H. Bone, Jr., Douglas, Ga.

1,775,795. **Safety Valve.** J. S. and A. M. Willcox, both of Savannah, Ga.

1,775,934. **Float Valve.** E. L. Delany, Brooklyn, N. Y.

1,776,106. **Shoe.** J. W. Cooke, N. Wilmington, Mass.

1,776,182. **Flashlight Balloon.** H. A. Cook, Dixon, Nebr.

Dominion of Canada

303,414. **Container Closure.** Dewey & Almy Chemical Co., Cambridge, assignee of C. H. Egan, Boston, and B. Dewey, Cambridge, all in Mass., U. S. A.

303,494. **Jar Rings.** H. D. Jackson and F. White, co-inventors, both of Walsall, Staffordshire, England.

303,514. **Valve Stem and Adapter.** J. C. Crowley, Cleveland Heights, O., U. S. A.

303,569. **Resilient Tire.** A. Tyler, Cumberland, Md., U. S. A.

303,582. **Inner Tube.** A-R Products Corp., assignee of W. A. Kline, both of Akron, O., U. S. A.

303,686. **Spring Seat Cushion.** Waugh Equipment Co., Chicago, Ill., assignee of R. J. O'Brien, Depew, N. Y., both in the U. S. A.

303,715. **Nursing Bottle.** W. M. Decker, Jr., Lancaster, and Manufacturers & Traders—Peoples Trust Co., executors of the estate, Buffalo, all in N. Y., U. S. A.

303,859. **Form Fitting Boot.** Mishawaka Rubber & Woolen Mfg. Co., assignee of G. L. Van Dinter, both of Mishawaka, Ind., U. S. A.

303,969. **Sink Trap Cleaner.** W. H. Scott, Rochester, N. Y., U. S. A.

304,012. **Channel Felt.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of H. deB. Rice, Bristol, R. I., U. S. A.

304,040. **Elastic Fabric.** Moore Fabric Co., assignee of J. V. Moore, both of Pawtucket, R. I., U. S. A.

304,051. **Automobile Floor Covering.** Paine & Williams Co., assignee of W. S. Vrooman, both of Cleveland, O., U. S. A.

304,102. **Container Closure.** G. H. Bennet, Hove, Sussex, England.

304,114. **Valve Stem.** J. C. Crowley, Cleveland Heights, O., U. S. A.

304,152. **Tank Partition.** J. Reid, Stoney Creek, Ont.

United Kingdom

330,951. **Floor Covering.** F. B. Dehn, London. (Paraffine Cos., Inc., San Francisco, Calif., U. S. A.)

331,019. **Vehicle Window Frame.** A. V. Johnson, Shooters Hills, Staffordshire.

331,033. **Liquid Level Gage.** P. Willmann, Berlin, Germany.

331,055. **Electric Light Fitting.** Benjamin Electric, Ltd., and H. T. Harrison, both of Tottenham, London.

331,071. **Draught Excluder.** T. C. Roper, Morden, Surrey.

331,117. **Vehicle Buffer and Drawgear.** G. Spencer, Moulton & Co., Ltd., and R. T. Glascodine, both of Westminster.

331,275. **Massage Device.** L. Lewis, Hampstead, London.

331,310. **Hose Coupling.** Electrolux, Ltd., London, and J. C. Hafner, Luton.

331,354. **Golfer's Eye Shade.** P. T. Prichard, Dannevirke, New Zealand.

331,376. **Electric Cable.** A. E. Hughes and Liverpool Electric Cable Co., Ltd., both of Bootle, Liverpool.

331,382. **Resilient Tire.** C. G. Worsley and P. L. Harkin, both of Victoria, Australia.

331,394. **Vehicle Shock Absorber.** R. T. Glascodine and G. Spencer, Moulton & Co., Ltd., both of Westminster.

331,454. **Electric Cable.** Siemens-Schuckertwerke Akt.-Ges., Berlin, Germany.

331,499. **Vehicle Shock Absorber.** Soc. Anon. Des Anciens Etablissements L. Laisne, Nantes, France.

331,560. **Massage Device.** W. N. Davies, Tonypandy, Glamorgan.

331,678. **Friction Wheel.** Guinea Portable Gramophone Co., Ltd., London. (C. P. Madsen, New York, N. Y., U. S. A.)

331,708. **Tire.** B. E. De Andrade, Sao Paulo, Brazil.

331,733. **Hot Water Bottle.** Dunlop Rubber Co., Ltd., London, and D. C. Campbell, Glasgow, Scotland.

331,767. **Side-Car Shock Absorber.** D. Burger, Vienna, Austria.

331,782. **Tennis Ball.** A. W. Phillips, Ltd. and J. Dolman, both of Nuneaton, Warwickshire.

331,808. **Springs.** R. T. Glascodine and G. Spencer, Moulton & Co., Ltd., both of Westminster.

331,828. **Acoustic Diaphragm.** E. M. Matthew, Sutton, Coldfield.

331,829. **Telephone Instrument.** D. S. S. Steuart, London.

331,838. **Lining Liquid Vessels.** Imperial Chemical Industries, Ltd., and F. H. Bramwell, both of London.

331,942. **Automobile Bonnet Fastenings.** Dunlop Rubber Co., Ltd., London, and S. Sadler, Fort Dunlop, Birmingham.

331,981. **Draught Excluder.** W. M. Hoskins, Birmingham.

331,984. **Hot Water Bag.** H. Ziele, Napier, New Zealand.

332,050. **Ball.** M. Breidenbach, Mainz, Germany.

332,099. **Vehicle Buffer and Drawgear.** A. Spencer, Westminster.

332,139. **Tire Pressure Gage.** C. Schneider, Hanover, Germany.

Germany

506,156. **Typewriter Foot.** Liga Gummiwerke A. G., Frankfurt a. M.-Hausen.

507,385. **Pneumatic Tire.** M. Leupold, New York, N. Y., U. S. A. Represented by G. Hirschfeld, Berlin S. W. 68.

507,387. **Inflatable Body.** I. and L. Dorogi and Dr. Dorogi & Co. Gummifabrik A. G., all of Budapest-Albertfalva, Hungary. Represented by W. Fritze and E. Boas, both of Berlin S. W. 61.

508,145. **Rubber Soled Shoe.** Maschinenfabrik Moenus A. G., Frankfurt a. Main.

508,879. **Reenforced Webbing.** G. F. Berne, Milan, Italy. Represented by A. Levy and F. Heinemann, both of Berlin S. W. 11.

509,012. **Tire Insert.** Pann-To-Werk G.m.b.H., Fabrik fur Autozubehor, Berlin N. 65.

Designs

1,132,552. **Sponge Rubber Figure.** H. Lindemann, Berlin S. W. 68.

1,132,651. **Bathing Cap.** Mubden-Hildesheimer Gummiwaaren-Fabriken Gebr. Wetzell A. G., Hildesheim.

1,132,656. **Sponge Rubber Cases.** E. Lindemann, Berlin S. W. 68.

1,132,833. **Suction Disks for Carpets.** A. Reiniker, Cannstatt bei Stuttgart.

1,132,835. **Closing for Containers.** Dunlop Rubber Co., Ltd., London, and James Mills & Co. (Engineers), Ltd., Heywood, both in England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a. Main, and T. R. Koehnhorn, Berlin S. W. 11.

1,133,183. **Soap Holder.** Continental Gummi-Werke A. G., Hannover.

1,133,226. **Sole Patch.** H. Fehland, Weissenfels, a.d.S.

1,133,616. **Overshoe.** F. Kestenbaum, Leipzig.

1,133,624. **Shoe.** K. Raasch, Bonn.

1,133,653. **Bathing Shoe.** Firma J. Landsberger, Berlin N. 54.

1,133,778. **Writing Material Holder.** Keller & Co., Inh., G. Keller, Nurnberg.

1,134,198. **Shoe Protector.** J. Koch, Nurnberg.

1,134,243. **Crepe Rubber Protector.** H. Heseker, Herford.

1,134,267. **Heel.** A. Drescher, Dusseldorf.

1,134,279. **Bicycle Saddle Cushion.** E. Wilhelm, Dessau-Jonitz.

1,134,431. **Sport and Bathing Shoe.** Harburger Gummiwarenfabrik Phoenix A. G., Harburg-Wilhelmsburg.

1,134,547. **Antiskid Crepe Sole.** Firma M. Dorsch, Jr., Wurzburg.

1,134,759. **Artificial Flower.** H. Lindemann, Berlin S. W. 68.

1,134,861. **Heel.** Firma Fr. Schwalfenberg, Essen a.d. Ruhr.

1,135,013. **Antiskid Sole.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg a.d. Elbe, Wilhelmsburg 1.

1,135,067. **Driving Belt.** H. Schwerdtner, Unna i. W.

1,135,071. **Exerciser.** A. Stori, Erlangen.

1,135,127. **Rubber Soled Shoe.** J. Katzendobler, Bogen a.d.D., Bavaria.

1,135,195. **Artificial Silk Heel.** Allgemeine Elektricitats-Gesellschaft, Berlin, N. W. 40.

1,135,323. **Sponge Rubber Bag.** Masonia Rubber Works, G.m.b.H., Wandsbek b. Hamburg.

1,135,398. **Thread with Covering.** Halstenbach & Co., Wuppertal-Barmen.

1,135,529. **Writing Pads.** F. Szepanscky, Berlin N. 65.

1,135,661. **Peg.** F. Richter, Leipzig S. 3.

1,135,766. **Band for Water Hose.** F. H. Reuss, Kaatschen b. Grossheringen i. Thuringia.

Prints

United States

12,692. **Miller Rubber Wear for Bathing.** Rubber wear for bathing. Miller Rubber Co., Akron, O.

Trade Marks

United States

274,244. Label consisting of representation of a knight in armor astride a horse, a scroll containing the words: '**Mahzel Brand,**" and a border containing the words: **"Twin City Drug Co., Minneapolis."** Druggists' sundries and prophylactic rubber goods. B. Krelitz, doing business as Twin City Drug Co., Minneapolis, Minn.

274,245. **Ajax.** Woven and molded brake band linings. Automotive Jobbers Assn., Chicago, Ill.

274,304. Representation of heads of three bucks and the words: **"Three Bucks."** Footwear. C. H. Daniels, Newton, Mass.

274,331. **Endurance.** Jars, cells, covers, vents, and separators for storage batteries. American Hard Rubber Co., Hempstead, N. Y.

274,337. Word: **"Ace"** to right of representation of a spade containing the letter: **"A."** Plating racks and tanks. American Hard Rubber Co., Hempstead, N. Y.

274,373. **Waage.** Rubber pencils, erasers, rubber tablets, rubber bands, etc. J. W. Guttknecht, Stein, Germany.

274,436. **Phoenix.** Rubber horse and mule shoes and rubber pads therefor, etc. Phoenix Mfg. Co., Joliet, Ill.

274,470. **Arch-Ped Estrian.** Footwear. May Dept. Stores Co., New York, N. Y.

274,504. **Ridgewood.** Footwear. Woodbury Shoe Mfg. Co., Derry, N. H.

274,510. **Tire-Tred.** Soles. Essex Rubber Co., Inc., Trenton, N. J.

274,556. **Petroflex.** Hose. Petro-Flex Tubing Co., Ltd., Watford, England.

274,561. **Stamper Kraft.** Rubber stamping sets. Superior Type Co., Chicago, Ill.

274,565. Label consisting of representation of a golfer on the links and the words: **"Moorgate Sport Wear. Bloomingdale's, New York, London.** Men's wearing apparel including raincoats. Bloomingdale Bros., Inc., New York, N. Y.

274,591. **Federal.** Dressing for auto tops and tires. Federal Rubber Co., Chicago, Ill.

274,662. Ellipse containing the word: **"Pontine."** Rubberized fabrics. E. I. du Pont de Nemours & Co., Wilmington, Del.

274,665. **Jatex.** Liquid latex having 60 per cent dry rubber content. L. V. Keeler, New York, N. Y.

274,667. Ellipse containing the word: **"Du Pont"** and below the word: **"Pontan."** Rubberized fabrics. E. I. du Pont de Nemours & Co., Wilmington, Del.

274,724. **Phoenix.** Radiator hose. Phoenix Mfg. Co., Joliet, Ill.

274,757. **Ruffcoat.** Bare and insulated wires and cables. General Cable Corp., New York, N. Y.

274,758. Representation of a section of cable and thereupon the words: **"Rome-Wixe."** Bare and insulated wires and cables. General Cable Corp., New York, N. Y.

274,776. Rectangle with rays extending therefrom and the representation of a human foot. Footwear. L. H. Glickman, Philadelphia, Pa.

274,781. Ellipse containing two circles containing the letter: **"D,"** and the words: **"Sport Styles. Her Activity Shoes. Kollege Kicks. 'Fashioned to Fit.'"** Footwear. Walker T. Dickerson Co., Columbus, O.

274,791. **Amulette.** Rubber articles used for medical purposes. "Vulkan" Gummiwarenfabrik Weiss & Baessler A.-G., Leipzig-Lindenau, Germany.

274,807. Label consisting of a coat-of-arms and the words: **"Bruntley Exclusively at Bloomingdale's, New York, London."** Men's wearing apparel including raincoats. Bloomingdale Bros., Inc., New York, N. Y.

274,808. Label consisting of a coat-of-arms and the words: **"Bruntley, Jr., Exclusively at Bloomingdale's, New York, London."** Boys' wearing apparel including raincoats. Bloomingdale Bros., Inc., New York, N. Y.

274,822. Representation of a woman's legs and a dog and the words: **"JoBo Shoes So Very Smart."** Footwear. Barnes Shoe Co., Centralia, Ill.

274,823. Ellipse containing the word: **"Olympic."** Gloves and aprons. J. C. Heckelman, doing business as Olympic Glove Co., New York, N. Y.

274,824. **Chix.** Gaiters and overshoes. The Converse Rubber Co., Malden, Mass.

274,865. **"Palmetto."** Belting. Victor Balata & Textile Belting Co., New York, N. Y.

274,880. Pennant flying the word: **"Federal."** Tires, inner tubes, tire flaps, belts and belting, hose and tubing, tire and tube patches and repair kits, valve bases, inside tire sleeves, air bags, transmission disks, tire repair plugs, and tire covers. Federal Rubber Co., Chicago, Ill.

274,901. **"Jiffy."** Dolls and apparel therefor. I. B. Kleinert Rubber Co., New York, N. Y.

274,911. Circle containing representation of an eagle, and to its right, the word: **"Eagle."** Tires and parts therefor, non-skid devices, tire protectors, tire and tube repair outfits, patches, and bandages. Goodyear Tire & Rubber Co., Akron, O.

274,915. Tag containing the words: **"Never-Splash, Trade Mark, Stocking Protector."** Shoe and stocking protector. R. C. Lee, Newark, N. J.

274,953. **Vitex.** Vent and flue pipes and fittings therefor. Plant Rubber & Asbestos Works, San Francisco, Calif.

275,078. **Garmentlife.** Elastic webbing. American Mills Co., Waterbury, Conn.

275,103. **Bril-tone.** Hand printing outfits, etc. Bril-Tone Products, Inc., Chicago, Ill.

275,104. Blue and gold flag. Flooring and tiling. Goodyear Tire & Rubber Co., Akron, O.

275,189. **Velvetex.** Gassed rubber composition made in sheets for use under mats, rugs, and floor coverings, and other articles. E. J. Moran, Chicago, Ill.

275,246. Red circle containing a square and the words: **"Tile-Tex."** Flooring. Tile-Tex Co., Chicago Heights, Ill.

275,247. **Tile-Tex.** Flooring. Tile-Tex Co., Chicago Heights, Ill.

275,290. **Super-Insulated.** Magneto collector units. Superior Hard Rubber Co., Butler, N. J.

Dominion of Canada

50,144. **Latexeam.** Tennis balls. A. G. Spalding & Bros. of Canada, Ltd., Brantford, Ont.

50,157. Numeral: **"7"** forming a background for a name and arrow heads pointing to the words: **"Point Brake Service."** Brake linings, clutch facings, sheet packing, and brake specialties. Canadian Raybestos Co., Ltd., Peterborough, Ont.

50,158. Numeral: **"8"** and the words: **"Point Brake Service."** Brake linings, clutch facings, sheet packing, and brake specialties. Canadian Raybestos Co., Ltd., Peterborough, Ont.

50,159. Word: **"Duraflex"** in conjunction with a specially designed device representing belting running over two pulleys. Gutta Percha & Rubber, Ltd., Toronto, Ont.

50,245. **Durawelt.** Tennis balls. A. J. Reach Wright & Ditson of Canada, Ltd., Brantford, Ont.

United Kingdom

503,878. Two red circular bands extending around the tire, one on each side of the cover. Tires. India Tyre & Rubber Co. (Great Britain), Ltd., Inchinnan, Renfrewshire, Scotland.

509,682. Circle containing representation of a streak of lightning and the word: **"Durabit."** Electrical insulating tapes. "Durabit" Gummiwerk-gesellschaft Mit Beschränkter Haftung, Vienna, Austria.

509,683. **Durabit.** Electrical insulating tapes. "Durabit" Gummiwerk-gesellschaft Mit Beschränkter Haftung, Vienna, Austria.

511,686. **Dorco.** Goods of gutta percha and india rubber not included in other classes than Class 40 and excluding pump diaphragms, etc. Dr. Dorogi És Társa Gummigyár Részvéntársaság, Budapest, Hungary.

512,663. Representation of a star and the monogram: **"P. & C. M."** Hose. Pirelli, Ltd., London, E. C. 4.

512,821. **Emerald.** Hose. Goodyear Tire & Rubber Co., Akron, O., U. S. A.

513,377. **Taurite.** Boxes, containers, cases, and tops therefor, washers, bushes, plugs, etc., and electrical insulating compositions. India-Rubber, Gutta-Percha & Telegraph Works Co., Ltd., London, E. C. 4.

513,573. **Diadem.** Erasers, rubber bands, etc. A. W. Faber Castellbleistift-Fabrik A. G., Stein, Germany.

513,574. **Paradox.** Erasers, rubber bands, etc. A. W. Faber Castellbleistift-Fabrik A. G., Stein, Germany.

513,575. **Paramount.** Erasers, rubber bands, etc. A. W. Faber Castellbleistift-Fabrik A. G., Stein, Germany.

513,806. **Sonny Boy.** Erasers, rubber bands, etc. A. W. Faber Castellbleistift-Fabrik A. G., Stein, Germany.

514,349. **Garagard.** Tennis shoes. Gutta Percha & Rubber (London), Ltd., London, W. 1.

514,449. **Windjammer.** All goods included in Class 40. Redfern's Rubber Works, Ltd., Hyde, near Manchester.

GUTTA PERCHA IS USED TO COAT ONE SIDE of an adhesive paper for lining bottle caps, the reverse side being varnished.

Designs

United States

81,900. **Crutch Tip.** Term 7 years. P. R. Wesley, assignor to Davol Rubber Co., both of Providence, R. I.

81,915 and 81,916. **Sole.** Term 3½ years. Wm. H. Burchfield, Oak Park, assignor to Dryden Rubber Co., Chicago, both in Ill.

81,917 and 81,918. **Heel.** Term 3½ years. Wm. H. Burchfield, Oak Park, assignor to Dryden Rubber Co., Chicago, both in Ill.

81,978. **Tire.** Term 14 years. Wm. Zak, San Francisco, Calif.

81,979. **Sponge Rubber Shoe.** Term 7 years. H. C. Hebig, Miami, Fla.

82,002. **Tire.** Term 14 years. A. H. Shoemaker, Seattle, Wash.

Dominion of Canada

8,861. **Sole.** Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

8,872. **Tire Tread.** Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

Statement of "India Rubber World"

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1930.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the Business Manager of the INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation,) etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: publisher, Federated Business Publications, Inc., 420 Lexington Avenue, New York, N. Y.; editor, Wm. M. Morse, 420 Lexington Avenue, New York, N. Y.; managing editor, Wm. M. Morse, 420 Lexington Avenue, New York, N. Y.; business manager, E. M. Hoag, 420 Lexington Avenue, New York, N. Y.

2. That the owner is: Federated Business Publications, Inc., Edward Lyman Bill, Inc., Bill, Brown & Bill Pub. Corp., Caroline L. Bill, Raymond Bill, Edward Bill, Randolph Brown, and J. B. Spillane, all located at 420 Lexington Avenue, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 29th day of September, 1930.

[SEAL] WM. A. LOW.

Notary Public, N. Y. Co. No. 473, Reg. No. 1L337. Certificate filed in Queens Co. No. 1087. (My commission expires March 30, 1931.)

MARKET REVIEWS

Crude Rubber

New York Exchange

THE general opinion of those interested in rubber is that prices cannot be expected to recover until after the turn of the year. At that time automobile manufacturers are expecting a revival in their industry, and tire manufacturers express the belief that in addition to a demand for new tires, the normal replacement demand should account for a large increase in production.

Current production, however, is still exceeding demand. World production for 1930 is estimated at 810,000 tons, and consumption at 720,000. While a small drop in the production of small native estates was announced for September, it is well known that natives will continue to produce whatever the price as long as they can find a market. If the better prices which prevailed for the week of October 25 are maintained, natives will increase their tapping area and erase the reduction referred to above.

What is needed more than anything else is the active resumption of trade activity. A good sign is evidenced in the fact that in spite of the erratic swings of the stock market, commodity prices appear to be steadying themselves. Consumption is gaining on production in many lines, and the index figures of leading statistical organizations show the price level of commodities to have reached a stabilized level. The Bureau of Labor Statistics' weighted index has barely changed for the last three months, for the figure has rested at 84 for all commodities.

RUBBER BULL POINTS

1. Production of crude rubber on estates of more than 100 acres in the Far East during September totaled 22,172 tons against 23,796 tons in August.
2. Production of crude rubber on estates of less than 100 acres during September was 17,772 tons compared with 22,307 for August.
3. Tire inventories continue to be lower.
4. Several native growers have failed.

RUBBER BEAR POINTS

1. World production in 1930 is estimated at 810,000 tons; while consumption will be about 720,000 tons.
2. Dealers' stocks in the Far East (excluding Singapore and Penang) as of September 30 aggregated 16,116 tons as compared with holdings of 15,775 tons at the end of the previous month.
3. September production of motor vehicles in the United States amounted to 222,931 units as against 223,048 during August and 415,912 during September last year.
4. Production of pneumatic casings during the first 7 months of this year amounted to 36,676,324 as against 50,960,722 in the same period of 1929, a drop of 28 per cent; shipments in the same period declined 24 per cent.
5. The Rubber Manufacturers' Association Report for September showed arrivals of 39,467 tons and consumption of 25,288 tons.
6. Native growers continue to tap, regardless of the price of rubber.

In London people are buying spot rubber for cash to hold in the hope of reaping a profit within a year or so. If the heavy oversupply can be reduced, and if business will recover in the next six months, that position will be justified.

The certain increase in foreign stocks gave the market a weak tone. A lowering of c. i. f. orders also helped to stimulate scattered liquidation coincident with a let-up in buying interest.

Rubber Exchange

Daily Futures—Smoked Sheets—Clearing House Prices—Cents Per Pound—"No. 1 Standard" Contracts

Positions 1930	September, 1930 26	27	29	30	October, 1930 1	2	3	4	6	7	8	9	10
Sept.	7.66	7.70	7.56	...	...	...	...	...	...	...	...	...	...
Oct.	7.66	7.60	7.50	7.36	7.38	7.40	8.15	7.98	7.55	7.80	7.98	8.00	7.70
Nov.	7.66	7.60	7.56	7.45	7.43	7.55	8.25	8.00	7.70	7.90	8.07	8.09	7.80
Dec.	7.76	7.80	7.66	7.56	7.48	7.73	8.35	8.08	7.83	7.96	8.16	8.18	7.95
1931													
Jan.	7.89	7.92	7.80	7.68	7.63	7.86	8.47	8.21	7.90	8.09	8.26	8.29	8.10
Feb.	8.02	8.03	7.93	7.80	7.77	7.98	8.59	8.33	8.00	8.22	8.35	8.39	8.20
Mar.	8.15	8.15	8.06	7.92	7.92	8.10	8.70	8.45	8.10	8.35	8.45	8.50	8.35
Apr.	8.29	8.30	8.21	8.03	8.06	8.25	8.85	8.57	8.20	8.47	8.55	8.60	8.45
May	8.42	8.45	8.35	8.14	8.20	8.40	8.90	8.68	8.30	8.58	8.65	8.70	8.55
June	8.53	8.55	8.46	8.24	8.30	8.50	9.05	8.79	8.45	8.70	8.78	8.82	8.68
July	8.62	8.65	8.57	8.34	8.40	8.62	9.12	8.90	8.60	8.82	8.90	8.95	8.80
Aug.	8.80	8.80	8.72	8.50	8.54	8.76	9.35	9.05	8.68	8.94	9.05	9.12	8.95
Sept.	...	...	...	...	8.70	8.90	9.50	9.20	8.85	9.10	9.20	9.29	9.10

Positions 1930	October, 1930 11*	13*	14	15	16	17	18	20	21	22	23	24	25
Sept.	...	...	...	...	...	...	...	...	...	...	...	...	...
Oct.	...	...	7.86	7.96	7.80	7.80	8.00	8.28	8.02	7.90	8.20	8.50	8.72
Nov.	...	...	7.96	8.06	7.90	7.90	8.10	8.37	8.15	8.00	8.30	8.60	8.82
Dec.	...	...	8.06	8.15	8.05	8.10	8.20	8.45	8.32	8.12	8.45	8.67	8.92
1931													
Jan.	...	...	8.18	8.27	8.17	8.20	8.32	8.58	8.44	8.26	8.57	8.80	9.10
Feb.	...	...	8.30	8.38	8.28	8.25	8.43	8.71	8.56	8.33	8.68	8.92	9.23
Mar.	...	...	8.42	8.50	8.40	8.38	8.55	8.84	8.68	8.41	8.80	9.05	9.35
Apr.	...	...	8.52	8.64	8.51	8.49	8.68	8.95	8.77	8.52	8.90	9.15	9.43
May	...	...	8.62	8.78	8.62	8.60	8.80	9.05	8.85	8.62	9.00	9.25	9.50
June	...	...	8.74	8.89	8.74	8.70	8.88	9.14	8.95	8.72	9.10	9.33	9.62
July	...	...	8.85	9.00	8.85	8.80	8.95	9.23	9.04	8.81	9.20	9.40	9.73
Aug.	...	...	8.98	9.12	8.98	9.00	9.09	9.38	9.14	8.95	9.30	9.52	9.85
Sept.	...	...	9.12	9.25	9.10	9.20	9.22	9.52	9.24	9.05	9.40	9.63	9.97

* Holiday.

Advices contained in a London cable to the New York Rubber Exchange indicate that a substantial reduction in crude rubber production in the Far East is expected as a result of the decision of the Anglo-Dutch Plantations of Java to cease production on some of its properties, but the cut in output will be too small to affect appreciably the market unless other companies take similar action.

"With reference to yesterday's cable stating that the directors of the Anglo-Dutch Plantations at Java have given instructions to cease production on estates outside of the original pamanoekan and Tjiamsem lands, in view of the uneconomic price of rubber," the report said, "cable advices state that the company owned 31,509 acres planted with rubber. The total output of all its estates during 1929, including 3,000,000 pounds from the P. & T. lands, was 13,129,158 pounds, produced at a cost of 6.31d. a pound, and with a selling price averaging 9.54d. a pound. The reduction in output is looked upon as a favorable sign so far as the market is concerned, but the amount involved is too small to have any marked effect. Replies to Reuter's inquiry as to whether other large companies contemplate action similar to that of the Anglo-Dutch Plantations of Java were non-committal."

Prices at the close on September 27 on the "No. 1 Standard" contract were:

Positions	High	Low	Close	Previous Close
Oct.	...	...	7.60	7.66
Nov.	...	...	7.60	7.66
Dec.	...	...	7.80	7.76
Jan.	...	...	7.92	7.89
Feb.	...	...	8.03	8.02
Mar.	...	...	8.15/8.17	8.15
Apr.	...	...	8.30	8.29
May	8.45	8.42	8.45	8.42/8.45
June	...	...	8.55	8.53
July	8.65	8.65	8.65/8.68	8.62/8.66
Aug.	...	...	8.80	8.80
Spot	...	...	7.62	7.62

Week ended October 4, 1930: The prospect of a decrease in foreign stocks, stronger cables, and the report that the Dutch Colonial Minister is ready to reconsider the rubber problem were the factors that sent the shorts to cover toward the latter part of the week with a rally in prices that sent rubber over 8 cents. The cable which reported a conference between members of the Dutch committee of the Rubber Growers' Association and the Netherlands Minister for the Colonies came from The Hague, and read as follows:

"In the course of the discussion it was made clear that the Government fully realized the danger of the situation and was ready to reconsider the rubber problem in all its aspects; further, that the Government is prepared to consider the possibility of taking measures to improve the situation.

"The Minister for the Colonies intends to cooperate with the Governor General of the Dutch East Indies for this purpose."

In view of past experience only an extremely apathetic market, such as we have been having since announcement was made of the failure of restriction efforts, could have found any encouragement in such an indefinite cable. Prices, however, are so

precariously low that any straw is sufficient to turn the tide. How temporary the rally was can be seen by the action of the market the next day. Prices were irregular and closed lower than the previous day.

Other cables to the Exchange gave the September shipments of crude rubber from Malaya. The total was 49,229 tons, an increase of 1,427 tons over the August shipments of 47,802 tons. A total of 27,344 tons of the September shipments was consigned to the United States, against shipments of 27,051 tons to this country from Malaya in the preceding month. Malayan imports of crude rubber last month were 8,107 tons, against 10,304 tons in August.

We also learn from cable advices to the Exchange that due to unprofitable prices, three firms engaged in the manufacture of amber and brown grades of crude rubber at Singapore have suspended operations. The ambers and browns are widely employed by tire manufacturers in this country as "softeners" with ribbed smoked sheets, the standard grade of crude rubber, in tire manufacture. Current New York quotations for the ambers range between 6¾ and 7⅛ cents per pound, those for clean thin brown crepe 7 cents, and rolled brown crepe 6⅝ cents.

Closing prices October 4 on the "No. 1 Standard" contract were:

Positions	High	Low	Close	Previous Close
Oct.	...	...	7.98	8.15
Nov.	...	...	8.00	8.25
Dec.	...	...	8.08	8.35
Jan.	...	...	8.21	8.47
Feb.	...	...	8.33	8.59
Mar.	8.50	8.50	8.45/8.50	8.70
Apr.	...	...	8.55	8.85
May	8.72	8.68	8.68	8.90/8.95
June	...	...	8.79	9.05
July	9.05	8.90	8.90	9.12/9.15
Aug.	...	...	9.05	9.35
Sept.	...	...	9.20	9.50
Spot	...	...	7.92	8.00

Week ended October 11: Stocks at London and Liverpool are expected to increase by about 1,400 tons next week, thus continuing an accumulation which was only temporarily halted the previous week. The triple-holiday caused further liquidation, and in sympathy with the weakness in the stock market, prices were down about 30 points at the close of the week.

RUBBER EXCHANGE ACTIVITIES

Week Ended	Transactions: Contracts Sold: Number	Transactions: Contracts Sold: Tons	Transferable Notices	Week-End Tone
Sept. 27	1,034	2,585.0	249	Quiet
Oct. 4	1,409	3,522.5	64	Barely steady
Oct. 11	822	2,055.0	52	Quiet
Oct. 18	174	435.0	0	Quiet
Oct. 25	1,381	3,452.5	52	Steady
Totals	4,820	12,050.0	417*	

* Deliveries of actual rubber.

Our contention that the reported reopening of the rubber conferences with the Dutch Government was of little consequence was verified in a cable to the Exchange on Wednesday.

"The London rubber market," the cable said, "does not give credence to the rumors current in New York of a renewal of negotiations between the Dutch and the British governments with the view of finding some relief for the rubber industry.

"Even the discussion at The Hague recently, when the Dutch committee of rubber growers received an audience from the Colonial Minister, is not taken seriously here. The London market is apparently only interested in rubber estates making their own future arrangements."

A bit of home news that carries interesting possibilities was contained in a statement from advices of the Lake Region to the local rubber trade. It stated that the westbound movement of crude rubber from New York through the port of Buffalo at the present time is the heaviest in the history of the port.

The bulk of these shipments, received at New York from the Far East, are destined for three of the largest tire manufacturing companies at Akron, O. The unprecedented movement of rubber over the barge canal at this time is reported to indicate a material improvement in operations at the tire factories.

George A. Bomm, general agent of the Cleveland & Buffalo Transit Co., states that the Buffalo warehouse of the company has been filled to capacity, despite the fact that lake vessels are removing merchandise cargoes daily.

Although the course of prices has been irregular during the week, the net change has been small; and in view of the plunge taken by prices in grain and stocks, the rubber market has given a fairly good account of itself.

On account of Columbus Day the Rubber Exchange was closed on Saturday and on Monday.

Prices at the close on October 10 were as follows on the "No. 1 Standard" contract:

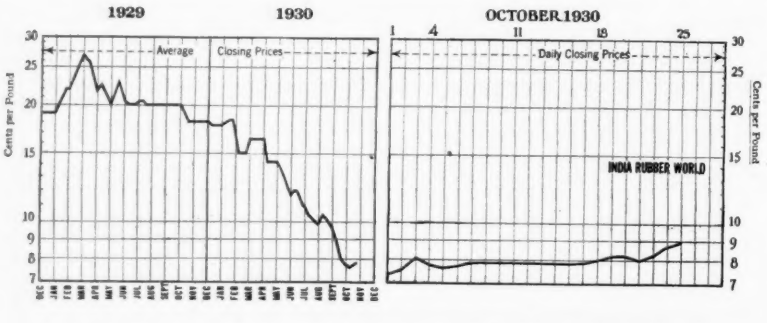
Positions	High	Low	Close	Previous Close
Oct.	...	...	7.70	8.00
Nov.	...	...	7.80	8.09
Dec.	8.05	8.05	7.95	8.18
Jan.	...	...	8.10	8.29
Feb.	...	...	8.20	8.39
Mar.	...	...	8.35/8.40	8.50/8.55
Apr.	...	...	8.45	8.60
May	8.68	8.68	8.55/8.60	8.70/8.75
June	...	...	8.68	8.82
July	8.70	8.70	8.80/8.83	8.95/9.00
Aug.	...	...	8.95	9.12
Sept.	...	...	9.10	9.29
Spot	...	...	7.87	8.05

Week ended October 18: In the face of the weakness in the securities markets the showing of rubber was comparatively good. The steadiness in rubber prices, however, was due more to lack of activity than any favorable news.

London stocks are expected to show an increase of about 1,100 tons for the week. Imports of crude rubber into London during September totaled 422,562 centals, against 232,259 centals in August and 461,217 centals in September last year, according to the London Board of Trade report received by the Rubber Exchange of New York on Tuesday.

Exports of crude rubber from London last month were 63,813 centals, against 44,792 centals in August and 80,182 centals in September, 1929. Rubber shipments from London to America in September were 1,352 centals against 1,636 centals in the previous month and 1,836 centals in September of last year.

Ceylon shipments of crude rubber during September totaled 7,878 tons as compared with 6,701 tons in the previous month. September shipments from Ceylon to the United States were 4,942 tons against 3,362 tons in August.



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	September, 1930								October, 1930															
	22	23	24	25	26	27	29	30	1	2	3	4	6	7	8	9	10	11*	13*	14	15	16	17	18
Ribbed Smoked Sheet	8	7⅞	7⅞	7⅞	7¾	7⅞	7⅝	7½	7⅜	7½	8⅜	7⅞	7⅝	7¾	7⅞	7⅞	7⅞	....	....	7⅞	7⅞	7⅞	7⅞	8
No. 1 Thin Latex Crepe	8¼	8⅛	8⅛	8⅛	8	7⅞	7⅞	7¾	7⅜	7¾	8⅜	8¼	8	8⅛	8⅛	8⅛	8⅛	....	....	8¼	8¼	8¼	8¼	8⅜
No. 1 Thick Latex Crepe	8	7⅞	7⅞	7⅞	7¾	7⅞	7⅝	7½	7⅜	7½	8⅜	7⅞	7¾	7¾	7⅞	7⅞	7⅞	....	....	7⅞	7⅞	7⅞	7⅞	8
No. 1 Brown Crepe	7⅝	7½	7½	7½	7⅜	7¾	7¼	7⅛	7	7	7½	7¼	7	7⅛	7⅜	7⅜	7⅜	....	....	7¼	7⅜	7⅜	7⅜	7½
No. 2 Brown Crepe	7¼	7¼	7¼	7¼	7⅛	7	7	6⅞	6⅝	6¾	7¼	7⅛	6¾	6⅞	7	7	7	....	....	7	7⅛	7	7⅛	7¼
No. 2 Amber	7⅜	7½	7½	7½	7⅜	7¼	7¼	7⅛	7	7⅛	7½	7⅜	7⅛	7¼	7⅜	7⅜	7⅜	....	....	7¼	7½	7⅜	7⅜	7½
No. 3 Amber	7⅜	7¼	7¼	7¼	7⅛	7	7	6⅞	6¾	6⅞	7¼	7⅛	6⅞	7	7⅛	7⅛	7⅛	....	....	7⅛	7¼	7⅛	7⅛	7¼
No. 4 Amber	7⅛	7	7	7	6⅞	6¾	6¾	6⅝	6½	6½	7	6¾	6⅝	6¾	6¾	6¾	6¾	....	....	6⅞	6⅞	6¾	6¾	6¾
Rolled Brown	6¾	6⅝	6⅝	6⅝	6½	6⅜	6⅜	6¼	6⅜	6½	6¾	6⅝	6½	6⅝	6⅝	6⅝	6⅝	....	....	6⅝	6¾	6⅝	6⅝	6¾

* Holiday.

In his annual report F. R. Henderson, president of The Rubber Exchange of New York, Inc., expressed the opinion that the present depression in the rubber industry is placing the business upon a sound basis for the future.

"The rubber industry has not escaped the effects of world-wide economic adjustments in the period under review," the report said. "Perhaps the effect on our industry has been more acute because of conditions peculiar to it.

"In the period of enforced production curtailment and the abnormal price level of 1925-1926, the native population of the British and Dutch East Indies planted rubber to an extent unknown until the vast quantities appeared at shipping points in the last year. This additional production came on a market facing underconsumption and partially discounting price effect. The result has been record low levels and accompanying disturbance to consumer as well as producer.

"It seems safe to say that we are entering the constructive period after all this; and while losses in many instances will be revealed, economies of operation will result in a sound rebuilding."

Prices on October 18 on the "No. 1 Standard" contract closed as below:

Positions	High	Low	Close	Previous Close
Oct.	...	...	8.00	7.80
Nov.	...	...	8.10	7.90
Dec.	...	...	8.20	8.10
Jan.	...	...	8.32	8.20
Feb.	...	...	8.43	8.25
Mar.	8.60	8.50	8.55	8.38/8.42
Apr.	...	...	8.68	8.49
May	8.90	8.85	8.80	8.60/8.64
June	...	...	8.88	8.70
July	9.00	9.00	8.95/9.00	8.80/8.83
Aug.	...	...	9.09	9.00
Sept.	...	...	9.22	9.20
Spot	...	...	8.06	8.00

Week ended October 25: A piece of news that was construed as bullish by some traders started the rubber market on its course of rising prices. The Far East monthly census disclosed a drop of 4,500 tons of rubber in the production by estates under 100 acres during September. A drop was also shown in the figures for estates of over 100 acres, but of only 1,624 tons. The decline in production by the smaller estates was attributed entirely to the present low prices for rubber, and the fact that many small planters are finding it unprofitable to gather the latex at present prices.

Other figures published during the week were not so favorable. Automobile production for September showed a decline from August, and arrivals again were far in excess of consumption for the same month. Stocks in London and Liverpool are expected to show an increase for the combined total, although London at this time will probably show a decrease in its own total.

On Thursday the new officers of the Rubber Exchange formally took office. John L. Julian is the new president, and William A. Overton vice president. The three new members of the Board of Governors are Robert L. Badenhop, Hutcheson Page, and Charles Slaughter. Mr. Julian succeeds F. R. Henderson, who had been president of the Exchange since it was organized in 1925.

Prices at the close on October 25 on the "No. 1 Standard" contract follow on the next page:

New York Quotations

Following are New York outside market rubber quotations for one year ago, one month ago, and October 25, current date

Plantation Hevea	October 26, 1929	September 26, 1930	October 25, 1930
Rubber latex (Hevea)...*gal.*	$1.45 @	$0.75 @$0.90	$0.75 @$0.90
Sheet			
Ribbed, smoked, spot	.19 @	.07⅞@	.08⅞@
October	.19 @	.08⅛@	.08⅞@
November-December	.19¼@	.08⅛@	.09 @.09⅛
January-March	.19¾@	.08¼@	.09⅜@
April-June	.20¼@	.08⅜@	.09⅝@
CREPE			
No. 1 Thin latex (first latex) spot	.19⅝@.20	.08¼@	.09¼@.09⅜
October	.20 @	.08½@	.09⅜@
November-December	.20¼@	.08½@	.09½@
January-March	.20¾@	.08¾@	.09¾@.09⅞
April-June	.21¼@	.09 @	.10⅛@
No. 2 Amber, spot ("B" blanket)	.16¼@	.07½@	.08 @
October	.16¼@	.07½@	.08 @
November-December	.16½@	.07½@	.08¼@
January-March	.17 @	.07¾@	.08⅜@
April-June	.17½@	.08 @	.08½@
No. 3 Amber, spot ("C" blanket)	.16 @	.07¼@	.07¾@
No. 1 Brown, clean, light, thin	.16¼@	.07½@	.07⅞@.08
No. 2 Brown, clean, thin	.16 @	.07⅜@	.07⅝@.07¾
Brown, roll	.11½@	.07 @	.07½@
East Indian			
PONTIANAK			
Banjermasin	.10 @	.06 @	.07 @
Pressed block	.14 @.15	.12 @	.12 @
Sarawak	.10 @	.06 @	.07 @
South American			
PARAS			
Upriver, fine	.19 @	.11 @	.12¼@
Upriver, fine	*.25 @	*.14¼@	*.15 @
Upriver, coarse	.09¾@	.06¼@	.08 @
Upriver, coarse	@	*.10 @	*.10½@

South American	October 26, 1929	September 26, 1930	October 25, 1930
PARAS—*Continued*			
Islands, fine	$0.17½@	$0.10½@	$0.11¾@
Islands, fine	*.24½@	*.14½@	*.14½@
Acre, Bolivian, fine	.19 @	.11¼@	.12½@
Acre, Bolivian, fine	*.25¼@	*.15 @	*.15 @
Beni, Bolivian	.19¼@	.11¼@	.12¾@
Madeira, fine	.18½@	.11 @	.12¼@
CAUCHO			
Upper caucho ball	.09¾@	.06 @	.07¾@
Upper caucho ball	*.16 @	*.10¼@	*.10½@
Lower caucho ball	.09 @	.05¾@	.07¼@
Manicobas			
Ceará negro heads	†.20 @	@	@
Ceará scrap	†.12 @	@	@
Manicoba, 30% guaranteed	†.22 @	@	@
Mangabiera, thin sheet	†.22 @	@	@
Guayule			
Duro, washed and dried	.18 @	.15 @	.15 @
Ampar	.19½@	.16 @	.16 @
Gutta Percha			
Gutta Siak	.18 @.19	.12¾@	.12¼@
Gutta Soh	@	.25 @	.25 @
Red Macassar	†2.60 @	2.00 @	1.75 @
Balata			
Block, Ciudad Bolivar	.45 @.46	.38 @	.34 @
Colombia	†.46 @	.33 @	.34 @
Manaos block	†.56½@	.39 @	.38 @
Surinam sheet	.52 @.53½	.58 @	.58 @
Amber	.55 @.57	.62 @	.63 @

* Washed and dried crepe. Shipment from Brazil.
† Nominal.

New York Outside Market (Continued)

	October, 1930					
	20	21	22	23	24	25
Ribbed Smoked Sheet	8¼	8⅛	8	8¼	8½	8⅞
No. 1 Thin Latex Crepe	8½	8½	8¼	8⅝	8⅞	9½
No. 1 Thick Latex Crepe	8¼	8¼	8	8⅜	8⅝	8⅞
No. 1 Brown Crepe	7⅝	7⅝	7½	7¾	8	8⅜
No. 2 Brown Crepe	7¼	7⅜	7¼	7½	7¾	8⅛
No. 2 Amber	7⅝	7⅝	7½	7¾	8	8¼
No. 3 Amber	7⅜	7½	7½	7⅝	7⅞	8⅛
No. 4 Amber	7	7	6⅞	7¼	7½	7⅝
Rolled Brown	6⅞	6⅞	6¾	7	7¼	7½

Low and High New York Spot Prices

PLANTATIONS	1930*	October 1929	1928
Thin latex crepe	$0.07⅝@$0.09¼	$0.19¼@$0.21¾	$0.19⅛@$0.19¾
Smoked sheet, ribbed	.07⅜@ .08⅞	.18¼@ .20⅜	.18¾@ .19
PARAS			
Upriver, fine	.12 @ .12¼	.19½@ .20½	.19¼@ .20½
Upriver, coarse	.06½@ .07¼	.10½@ .11	.13¼@ .14
Upper caucho ball	.06 @ .07¼	.10½@ .11	.12 @ .13

* Figured to October 27, 1930.

Positions	High	Low	Close	Previous Close
Oct.	...	..	8.72	8.50
Nov.	...	...	8.82	8.62
Dec.	9.00	8.85	8.92/8.98	8.67
Jan.	...	...	9.10	8.80
Feb.	...	...	9.23	8.92
Mar.	9.40	9.20	9.35	9.05/9.10
Apr.	...	...	9.43	9.15
May	9.55	9.42	9.50	9.25
June	...	...	9.62	9.33
July	9.75	9.60	9.73	9.40/9.43
Aug.	...	...	9.85	9.52
Sept.	10.00	10.00	9.97	9.63
Spot	...	...	9.00	8.62

Active selling on the Exchange on October 27 prevented continuation of the advance of the previous week. No. 1 Standard contracts were barely steady at 26 to 38 points decline. Sales were 810 long tons; "A" contracts barely steady, 20 to 30 points decline. Sales were 392½ long tons. Spot ribbed smoked sheets closed at 8¾ cents, nominal.

N. Y. Outside Market

In the last week on which we report, that of October 25, rubber prices rallied more than 1 cent for the first time in a long period. Although the rise was maintained for several days, traders did not express much confidence in the continuance of the rise. The crop in native production on estates of less than 100 acres started the rise, it is believed, and covering by a considerable short interest helped to sustain it.

In support of their contention that the rise is premature, traders can bring many bearish figures to bear them out. Even the most satisfactory feature, the continued drop in tire inventories, loses its significance when it is realized that tire production for the first seven months of this year is 28 per cent less than that of the previous year. Automobile production, likewise, is still dropping off, with September's figures showing a decline from those of August.

While the low prices are forcing many producers to the wall, stocks on hand are sufficient for several months' needs, and there is a limit to the reduction to be expected from native producers. No matter how low the price, native owners must tap their trees if they expect to live.

Another angle is given the problem, however, by some of the larger producers, who claim that they can produce rubber at a cost of less than 8 cents, which is considerably lower than the cost of 15 cents previously estimated.

Week ended September 27: Those bearish traders who are not satisfied even with the present low prices were justified this week. Prices lost 20 to 30 points during the week, with the undertone none too strong. Buyers were scarce, and the slightest amount of liquidation accounted for a few points decline.

Rubber shipments from the native producing areas in the Dutch East Indies decreased slightly, but foreign stocks continue to accumulate. A much more radical reduction in shipments than is now in evidence will be required to have any effect on the market. September shipments are estimated at 38,000 tons.

The market closed the week in an unsteady condition; and fresh liquidation seems likely, with the other commodities and the stock market also in a declining trend, rendering little support to rubber. Prices at the close on September 27 were:

Spot	Sept. 27	Month Ago	Year Ago
Crepe	7⅞	10½	20¾
Ribs	7⅝	10	19¾
Upriver fine ...	12¼	13¼	20¾

Week ended October 4: When an announcement made by the Dutch Government was received on Friday stating that discussions of restriction would be resumed, the market rallied some 70 points. Of course statements of this nature have been made for the last year, but coming when it did, it had a strong psychological effect. Another factor which aroused bullish sentiment was the expectation that stocks in London would show a sharp decrease, the first time in many months.

Factories did very little buying. The large sales on the rally were accredited to short covering. Manufacturers are well stocked, and the disappointing demand for their wares has necessitated a policy of hand-to-mouth buying, except in a few cases.

October and November deliveries dropped as low as 7.30 cents in the first part of the week, but the subsequent rally sent them to 8.10 cents. At the end of the week these two deliveries stood at about 8 cents, a rally of almost 40 points over the quotations at the close of the previous week. The general list was 20 to 40 points higher than the previous week. Closing prices on October 4 follow:

Spot	Oct. 4	Month Ago	Year Ago
Crepe	8¼	9⅞	20¾
Ribs	7⅞	9½	19¾
Upriver fine....	12	13¼	20¼

Week ended October 11: With a rather empty market, prices were irregular for the week, but the undertone was unexpectedly strong. The lack of activity was in sharp contrast to the hectic week on the Stock Exchange where prices broke through their 1929 lows.

One reason for the poor market for rubber might be found in the adjusted automobile index of *The New York Times*. The index was 49.5 for the week ended October 4, as compared with 53.4 for the week ended September 27 and with 110.5 in the corresponding week last year. The decline is due to the reduced production of low-priced cars, with the exception of Ford. It is also stated that trade surveys indicate little if any improvement in retail sales in September or thus far in October. Buyers are waiting for 1931 models, and dealers are trying to clean up the old stocks by price-reducing inducements.

The lack of improvement in retail sales might be taken as an indication that the sales of tires at filling stations have not as yet made any material change in the retail tire situation, but conditions will bear watching. Closing prices on October 11 were:

Spot	Oct. 11	Month Ago	Year Ago
Crepe	8⅛	8½	21⅛
Ribs	7⅞	8⅛	20¾
Upriver fine....	12	12¾	20½

Week ended October 18: After the holiday the market acted as if it had a "big head." On Tuesday the total number of sales recorded amounted to only 47½ tons for both contracts on the Exchange. At present there seems to be a deadlock, with manufacturers stepping out of the market on the slightest indication of a rise. If apathy can be called a feature, the market showed an amount of inactivity that was disheartening.

At that, prices did not vary much over the entire week. Irregularities were within about a 20-point range, but a little better tone at the close left the market at almost the same place from which it had started. Another unusual fact was remilled grades were holding even steadier than blanket grades.

The consumption of 25,288 tons for September was generally in line with expectations and showed a decrease of 5,307 tons from the August figure. Ceylon shipments of crude rubber during September totaled 7,878 tons, as compared with 6,701 tons in the previous month. September shipments from Ceylon to the United States were 4,942 tons against 3,362 tons in August. Closing prices on October 18 were:

Spot	Oct. 18	Month Ago	Year Ago
Crepe	8⅜	8½	21
Ribs	8	8⅛	20
Upriver fine....	12	12¾	20¼

Week ended October 25: The market rallied steadily during the week, and closing prices were more than one cent higher than those of the previous week. Several reasons were given as responsible for the rise, one of which was the failure of five Chinese producers of remilled grades. Due to the lack of native supply the grades manufactured by these producers, the ambers, browns, and other soft rubber grades, became scarce in the market. With the elimination of the supply of this rubber, the ribbed smoked sheets were in strong demand, and the price was bidded up.

Another reason given for the favorable action of the market was the action taken by the French in eliminating a tariff on rubber imported to their markets. As the market displayed its strength, many traders who were short ran to cover.

That the market will hold its position is doubted by many traders. It is not a lack of optimism but a square facing of the facts that makes it seem that any rise that comes this year is premature. Stocks on hand are too large, and consumption is too meager for a sustained rise. Until the technical position of rubber becomes a good deal stronger, traders will be skeptical of any rise. Closing prices on October 25 were:

Spot	Oct. 25	Month Ago	Year Ago
Crepe	9¼	8¼	19⅞
Ribs	8⅞	7⅞	19
Upriver fine....	12¼	12¼	19¾

The advance of spot ribs to 8⅞ cents on October 25 was attributable to the fact that French rubber manufacturers for a few days were buying nearby rubber in London, anticipating that their government would place a tax on Far Eastern plantation rubber as a protective measure in favor of rubber from French colonial possessions.

The market on October 27 was less active with spot at 8¾ cents. The advance stimulated some speculative interest but did not influence purchasing by manufacturers, who are not inclined to follow up promptly an initial rise in price.

Rubber Scrap

THE market for rubber scrap in general was quiet during the past month with movement in moderate volume to meet reclaimers' consuming requirements. Price reductions are confined to the groups of inner tube and tire grades. The only exception is light gravity solid tires, which are quoted at $2 advance over one month ago owing to their increasing scarcity.

The prices of rubber scrap have been forced down to lowest levels in conformity with the prices for reclaim. Apparently the bottom has been reached.

BOOTS AND SHOES. In this grade demand is improving, but prices are so low that collectors are unable to assume the expense of assorting black from colored scrap. The latter is considered undesirable as compared with black grades.

INNER TUBES. Trade in inner tubes is seasonable and shows slightly improved demand. On all of the grades listed quotations are less than one month ago. The greatest drop is in No. 1 floating, quoted down 1⅜ cents from 6⅝ cents on September 25. The remaining grades are down ¼- to ⅜-cent from a month ago.

TIRES. These grades are in fair demand. Quotations are down 50 cents a ton on mixed grades both with and without beads. Auto tire carcass quality has dropped $4 a ton from last month's quotation. Clean mixed solid truck grade is unchanged; while light gravity solid has advanced to $29 a ton.

MECHANICALS. All varieties in this classification are quoted unchanged with trade very quiet.

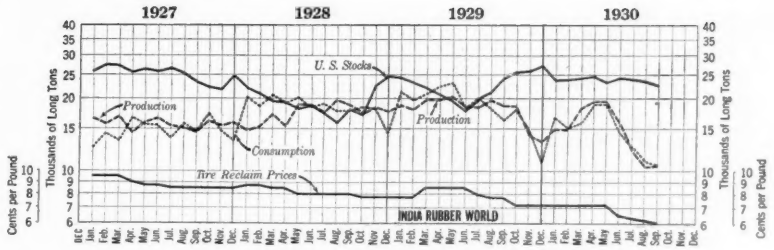
HARD RUBBER. Trade is dull. No. 1 quality is in moderate demand for conversion into standard dust. The quotation is unchanged.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills
October 27, 1930

	Prices
Boots and Shoes	
Boots and shoes, black..100 lb.	$1.10 @$1.15
Untrimmed arctics....100 lb.	.70 @ .80
Tennis shoes and soles..100 lb.	.60 @ .70
Inner Tubes	
No. 1, floating.....lb.	.05¼ @ .05½
No. 2, compound.....lb.	.02⅛ @ .02⅜
Red .....lb.	.02¼ @ .02½
Mixed tubes.....lb.	.02¼ @ .02⅜
Tires	
Pneumatic Standard	
Mixed auto tires with beads .....ton	11.50 @12.00
Beadless .....ton	15.00 @15.50
Auto tire carcass.....ton	17.00 @17.50
Black auto peelings....ton	20.00 @21.00
Solid	
Clean mixed truck....ton	24.50 @25.50
Light gravity.....ton	29.00 @30.00
Mechanicals	
Mixed black scrap.....lb.	.00¾ @ .01
Hose, air brake.....ton	14.00 @16.00
Garden, rubber covered..lb.	.00⅜ @ .00½
Steam and water, soft..lb.	.00⅜ @ .00½
No. 1 red.....lb.	.02 @ .02¼
No. 2 red.....lb.	.01 @ .01½
White druggists' sundries..lb.	.02 @ .02½
Mechanical .....lb.	.01½ @ .01⅝
Hard Rubber	
No. 1 hard rubber.....lb.	.10 @ .10½



Production, Consumption, Stocks, and Prices of Tire Reclaim

Reclaimed Rubber

CURRENT quotations remain unchanged from those of one month ago except in the cases of white auto tire and washed shoes. These grades are each down ¼-cent. The leading reclaimers are operating their plants actively.

One prominent company, for example, is operating its reclaiming plant six days a week employing its full number of men. Some large orders have been placed for reclaims from the tire, footwear, heels, insulated wire, and automobile topping divisions of the rubber industry. Profit, however, is the last consideration at the present juncture.

During the past nine months or so reclaim has endured successfully the acid test imposed by the phenomenally low price of crude rubber. Its technical and economic value in the industry has thus been finally demonstrated and accepted. As evidence of these facts the ratio of the consumption of reclaim to crude has continued well above 40 per cent except in August, when it fell to 35.9 per cent. During September it rose to 41.4 per cent and will probably regain lost ground as crude again advances in price.

Thus far this year production and consumption of reclaim have been balanced closely as shown by the R. M. A. statistics published in the table on this page. This adjustment of supply and demand will doubtless continue as a safeguard against overburdening inventories.

The fact that the ratio of reclaim to crude rubber consumption has been so well maintained the past summer demonstrates the dependability of quality and price stability of standard reclaim grades. Their success in general rubber compounding is in effect a tribute to American rubber technical practice.

New York Quotations

October 27, 1930

	Spec. Grav.	Price Per Pound
High Tensile		
Super-reclaim, black...	1.20	$0.08½ @$0.08¾
red	1.20	.08¼ @ .08½
Auto Tire		
Black	1.21	.05¾ @ .06
Black selected tires....	1.18	.06 @ .06½
Dark gray	1.35	.07 @ .07½
White	1.40	.08½ @ .08¾
Shoe		
Unwashed	1.60	.06 @ .06¼
Washed	1.50	.07¾ @ .08
Tube		
No. 1	1.00	.08½ @ .08¾
No. 2	1.10	.07½ @ .07¾
Truck Tire		
Truck tire, heavy gravity	1.55	.06 @ .06¼
Truck tire, light gravity	1.40	.06¼ @ .06½
Miscellaneous		
Mechanical blends.....	1.60	.05 @ .05½

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45 9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208.516	223,000	50.4	24.785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1929					
January	18,685	21,068	49.1	24,394	941
February	18,094	19,829	47.7	23,305	1,028
March	19,984	20,068	46.7	22,076	1,344
April	19,899	21,574	47.3	20,680	1,498
May	20,385	23,176	47.1	19,479	1,299
June	18,416	18,141	42.0	17,980	961
July	18,387	20,236	48.7	19,679	1,202
August	19,787	18,230	47.6	22,309	860
September	18,660	16,416	47.2	24,984	657
October	18,968	18,024	51.8	25,474	830
November	14,363	14,742	53.4	26,080	1,232
December	13,429	11,089	47.1	27,464	869
1930					
January	15,010	16,785	45.8	24,241	954
February	15,847	14,918	45.5	24,241	1,203
March	17,400	15,616	43.2	24,415	1,048
April	17,828	17,321	43.0	24,592	740
May	17,812	17,473	43.7	23,356	939
June	15,745	14,410	41.6	24,484	641
July	12,320	12,688	42.3	23,870	778
August	10,361	10,999	35.9	23,610	807
September	10,460	10,480	41.4	22,593	656

* Stocks on hand the last of the month or year.
Compiled by Rubber Manufacturers Association.

Compounding Ingredients

NO marked change occurred in the October demand for the general line of compounding ingredients from that prevailing in recent months. Tire schedules are met by production on approximately half capacity although certain of the smaller producers are operating at a much better rate. Footwear, mechanicals, and heels are being produced at a rather moderate rate. Druggists' sundries and insulation are both fairly active.

The demand for specialized organic chemicals, such as accelerators, antioxidants, colors, etc., is less seriously reduced than that for the general run of pigments because of the former's virtual necessity for the economical production of goods of all qualities in every line of rubber production.

ACCELERATORS. These materials are so essential to economy of production and of such varied adaptation to the various curing processes that they are in steady demand with certain kinds ever growing in popularity.

ANTIOXIDANTS. These materials are established in the same class as accelerators, for both are indispensable adjuncts in rubber compounding for goods of all qualities. Since they are obtainable with characteristics suitable for protection against various types of aging, all types of age resisters at present are in active demand.

CARBON BLACK. The demand for standard carbon black is slow and steady. The reduction in its price the last of October to a basis of 4 cents f. o. b. Texas and 4½ cents Louisiana did not stimulate consuming demand. This price reduction places the carbon black market level at one-half that of one year ago.

CLAY. This material is being used to a less extent than a year ago because at present price levels of crude rubber the demand for second and third grade tires is largely eliminated. The reenforcing value of clay is naturally much less than that of carbon black and at present price levels offers no advantage.

LITHARGE. The price was reduced on October 4 by ¼-cent, making the price 7¾ cents a pound.

The movement of the material has been slow and steady.

LITHOPONE. Fairly active demand at firm prices has featured the market for lithopone.

SOFTENERS. These essential materials function effectively for power economy in compounding, general machining, and molding of mixed stock. Fortunately they are of low price, and all varieties are in steady demand since they find place in mixings for goods of all qualities.

VMP NAPHTHA. This universally used rubber solvent has not been affected by the weakening position of the gasoline market. Prices are firm and unchanged.

New York Quotations

October 27, 1930

Abrasives

Marble flour	ton	$20.00	@$25.00
Pumice stone, pwd.	lb.	.02½ @	.04
Rottenstone, domestic	ton	23.50 @	28.00
Rottenstone, English	lb.	.04 @	.05
Silica	lb.	.01¼ @	.05

Accelerators, Inorganic

Lead, carbonate	lb.	.07¾ @	
red	lb.	.08¾ @	
sublimed blue	lb.	.07¾ @	
sublimed white	lb.	.07¼ @	
super-sublimed white	lb.	.07¼ @	
Lime flour, hydrated	ton	20.00 @	35.00
Litharge	lb.	.07¾ @	
Magnesia, calcined, heavy	lb.	@	
carbonate	lb.	.06 @	.07
Orange mineral A.A.A.	lb.	.10¾ @	

Accelerators, Organic

A-1	lb.	.22 @	.27
A-5-10	lb.	.31 @	.36
A-7	lb.	.55 @	.65
A-11	lb.	.62 @	.75
A-16	lb.	.57 @	.65
A-19	lb.	.58 @	.75
A-32	lb.	.70 @	.75
Accelerator 49	lb.	.35 @	.41
Aldehyde ammonia	lb.	.65 @	.70
Barak	lb.	@	
B. L. E.	lb.	@	
Butene	lb.	@	
Captax	lb.	@	
Crylene	lb.	@	
paste	lb.	@	
D. B. A.	lb.	@	
D. O. T. G.	lb.	.42 @	.47
D. P. G.	lb.	.30 @	.35
Ethylidine aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.40
Heptene	lb.	@	
base	lb.	@	
Hexamethylenetramine	lb.	.58½ @	.61
Lead oleate, No. 999	lb.	.14 @	
Witco	lb.	@	
Lithex	lb.	@	
Monex	lb.	@	
Phenex	lb.	.70 @	
Pipsol	lb.	4.00 @	4.50
Plastone	lb.	@	
R-2	lb.	1.75 @	2.15
base	lb.	4.50 @	5.00
R & H 40	lb.	.40 @	.42½
50	lb.	.40 @	.42½
397	lb.	.75 @	.77½
Safex	lb.	@	
S-P-D-X	lb.	.07 @	
Super-sulphur No. 1	lb.	@	
No. 2	lb.	@	
Tensilac 39	lb.	.40 @	.42½
Thermlo F	lb.	@	
Thiocarbanilid	lb.	.26½ @	.28½
Trimene	lb.	@	
base	lb.	@	
Triphenyl guanidine	lb.	.58 @	.60
Tuads	lb.	@	
Ureka	lb.	.70 @	1.00
V. G. B.	lb.	@	
Z. B. X.	lb.	@	
Z-88-P	lb.	.50 @	.60
Zimate	lb.	@	

Acids

Acetic 28% (bbls.)	100 lbs.	2.73 @	2.98
glacial (carboys)	100 lbs.	10.18 @	10.43
Sulphuric, 66°	ton	15.50 @	

Alkalies

Caustic soda, 76% solid	100 lbs.	$2.90 @	

Antioxidants

Age-Rite, powder	lb.	@	
resin	lb.	@	
white	lb.	@	
Albasan	lb.	@	
Antox	lb.	@	
Oxynone	lb.	.68 @	.90
Resistox	lb.	.54 @	.65
Stabilite	lb.	.57 @	.62
Alba	lb.	.70 @	
Zalba	lb.	@	

Antisun Materials

Heliozone	lb.	@	
Sunproof	lb.	@	

Binders, Fibrous

Cotton flock, dark	lb.	.09 @	.10½
dyed	lb.	.50 @	.70
white	lb.	.11½ @	.23

Colors

BLACK

Bone	lb.	.07½ @	.08½
Carbon (see Reenforcers)			
Drop (bbls.)	lb.	.05½ @	.15
Lampblack (commercial)	lb.	.07 @	.08

BLUE

Blue toners	lb.	.60 @	3.85
Huber, brilliant	lb.	3.50 @	4.00
Prussian	lb.	.35 @	.37
Ultramarine	lb.	.06 @	.30

BROWN

Huber, mocha	lb.	1.60 @	2.10
Iron oxide	lb.	.03 @	.20
Mapico	lb.	.16 @	
Sienna, Italian, raw	lb.	.05½ @	.12½

GREEN

Chrome, light	lb.	.27 @	.31
medium	lb.	.28 @	.31
Chromium oxide	lb.	.25 @	.27
Green toners	lb.	1.00 @	3.60
Huber, brilliant	lb.	3.75 @	4.25

ORANGE

Cadmium sulphide	lb.	.90 @	1.00
Huber, Persian	lb.	.50 @	1.00
Orange toners	lb.	1.40 @	1.60

ORCHID

Orchid toners	lb.	1.05 @	1.70

PINK

Pink toners	lb.	1.00 @	1.80

Colors *(Continued)*

PURPLE

Purple toners	lb.	$0.60 @	$1.90

RED

Antimony			
Crimson, R. M. P. No. 3	lb.	.48 @	
Sulphur free	lb.	.52 @	
7-A	lb.	.35 @	
Z-2	lb.	.22 @	
Cadmium	lb.	1.15 @	1.25
Huber, brilliant	lb.	1.35 @	1.85
Iron Oxides			
bright pure domestic	lb.	.10 @	.12
bright pure English	lb.	.11 @	.12
bright reduced English	lb.	.08 @	.09
bright reduced domestic	lb.	.04 @	.08
Indian (maroon), pure domestic	lb.	.10 @	
Indian (maroon), pure English	lb.	.09¾ @	.10½
Indian (maroon), reduced English	lb.	.08 @	.09
Indian (maroon), reduced domestic	lb.	.03 @	.07½
Mapico	lb.	.09 @	
Oximony	lb.	@	
Red toners	lb.	.95 @	2.75
Rub-er-red	lb.	.08¾ @	
Spanish red oxide	lb.	.03 @	.04
Sunburnt red	lb.	.14 @	
Venetian red	lb.	.01½ @	.05

WHITE

Lithopone	lb.	.05½ @	.05¾
Albalith	lb.	.05¼ @	.05½
Azolith	lb.	.05¼ @	.05¾
Cryptone	lb.	.07¼ @	.07½
Grasselli (50 lb. bags)	lb.	.05¼ @	.05½
(400 lb. bbls.)	lb.	.05½ @	.05¾
Titanium oxide, pure	lb.	.22 @	
Titanox "B"	lb.	.07¼ @	.07¾
"C"	lb.	.07¾ @	.08½
Zinc Oxide			
AAA (lead free) (bbls.)	lb.	.07 @	
Azo (factory):			
ZZZ (lead free)	lb.	.06½ @	.07
ZZ (leaded)	lb.	.06¼ @	.06¾
Z (8% leaded)	lb.	.06¼ @	.06¾
Green seal	lb.	.10⅜ @	.10⅝
Green seal, Anaconda	lb.	.10⅜ @	.10⅝
Kadox, black label	lb.	.10⅜ @	.10¾
blue label	lb.	.09⅜ @	.09¾
red label	lb.	.08 @	.08¼
Red seal	lb.	.09⅜ @	.09⅝
Red seal, Anaconda	lb.	.09⅜ @	.09⅞
Special	lb.	.07 @	.07¼
White seal	lb.	.11⅝ @	.11⅞
White seal, Anaconda	lb.	.11⅝ @	.11⅞
XX green	lb.	.07 @	.07¼
XX red	lb.	.06½ @	.06¾
Zinc sulphide	lb.	.16 @	.16¼

YELLOW

Cadmium sulphide	lb.	.65 @	1.40
Chrome	lb.	.17 @	.17¼
Huber, canary	lb.	2.80 @	3.30
Mapico	lb.	.12 @	
Ochre, domestic	lb.	.01⅝ @	.02⅛
French	lb.	.03 @	.04
Oxide, pure	lb.	.09 @	
Zinc, C. P., imported	lb.	.21 @	

Factice—See Rubber Substitutes

Fillers for Pliability

Flex ..... lb.		@	
Fumonex ..... lb.	$0.04	@	$0.08
P-33 ..... lb.		@	
Thermax ..... lb.		@	
Velvetex ..... lb.	.03	@	.06

Fillers, Ordinary

Asbestine ..... ton	13.40	@	14.00
Baryta white (f.o.b. St. Louis, bbls.) ..... ton	23.00	@	
(f.o.b. St. Louis, paper bags) ..... ton	22.20	@	
Barytes, white, spot..... ton	30.00	@	40.00
off color, spot..... ton	20.00	@	25.00
Foam "A" (f.o.b. St. Louis) ..... ton	23.00	@	
Basofor ..... lb.		@	
Blanc fixe, dry..... lb.	.04½	@	
pulp ..... ton	42.50	@	45.00
C-C-O white (f.o.b. St. Louis, bbls.) ..... ton	15.00	@	
Infusorial earth ..... ton	45.00	@	50.00
Slate flour, gray (fact'y). ton	7.00	@	
Whiting			
Chalk, imported...100 lbs.	.95	@	1.50
Domestic ..... 100 lbs.	1.00	@	
Paris White, English cliffstone ..... 100 lbs.	1.50	@	3.50
Quaker ..... ton		@	
Sussex ..... ton		@	
Witco (l. c. l.) (f.o.b. New York) .. ton		@	

Finishes

Mica, amber ..... lb.		@	
Shellac, fine orange..... lb.	.60	@	
Starch, corn, pwd...100 lbs.	3.62	@	3.82
potato ..... lb.	.05½	@	.06
Talc, domestic ..... lb.	.01¼	@	
dusting ..... lb.	.01¼	@	.04
French ..... ton	18.00	@	22.00
Pyrax A ..... ton		@	

Inflating Material

Ammonium carb., pwd.... lb.	.10	@	
lump ..... lb.	.09½	@	

Mineral Rubber

Fluxrite (solid) ..... lb.		@	
Genasco (fact'y) ..... ton	40.00	@	42.00
Gilsonite (fact'y) ..... ton	37.14	@	39.65
Granulated M. R..... ton		@	
Hydrocarbon, hard..... ton		@	
Ohmlac Kapak, M. R. (f.o.b. fact'y) ..... ton	60.00	@	
M. 4 (f.o.b. fact'y)... ton	175.00	@	
Paradura (fact'y)..... ton	62.50	@	65.00
Parmr Grade 1..... ton	23.00	@	28.00
Grade 2 ..... ton	23.00	@	28.00
Pioneer, M. R., solid fact'y ..... ton	40.00	@	42.00
M. R. granulated..... ton	50.00	@	52.00
Robertson, M. R., solid (fact'y) ..... ton	34.00	@	80.00
M. R. granulated..... ton	38.00	@	80.00

Mold Lubricants

Rusco mold paste..... lb.	.12	@	.30
Soapbark (cut) ..... lb.	.09	@	.10
Soapstone ..... ton	15.60	@	25.00

New York Quotations

October 27, 1930

Oils

Kerosene ..... gal.	$0.10	@	
Mineral ..... gal.	.20	@	
Poppy seed oil..... gal.	1.70	@	
Rapeseed ..... gal.		@	
Red oil, distilled..... lb.	.08⅞	@	.09⅛
Rubber process ..... gal.	.25	@	
Spindle ..... gal.	.30	@	

Reenforcers

Aluminum flake (sacks, c. l.) ..... ton	21.85	@	
(sacks, l.c.l.) ..... ton	24.50	@	
Carbon Black			
Aerfloted arrow ..... lb.	.04½	@	.09
Century (works, La., c. l.) ..... 100 lbs.		@	
Disperso (works, La., c. l.) ..... 100 lbs.		@	
Excello ..... lb.	.04	@	
Gastex (f. o. b. fact'y)			
contracts ..... lb.	.04	@	
carload ..... lb.	.04	@	
less carload ..... lb.	.05¼	@	.07½
Micronex ..... lb.	.04½	@	.09
Ordinary (compressed or uncompressed) ..... lb.	.04	@	.08
Palmer gas black..... lb.	.04	@	
Supreme ..... lb.	.04	@	
Clays			
Bento ..... lb.	.02½	@	.03
Blue Ridge, dark..... ton		@	
China ..... lb.	.01¼	@	
Dixie ..... ton		@	
Dusto ..... lb.	.05	@	.07
Langford ..... ton		@	
Lexo (works)..... ton	8.00	@	
Par ..... ton		@	
Perfection ..... ton		@	
Suprex ..... ton	8.00	@	20.00
Glue, high grade..... lb.	.27	@	.35

Rubber Substitutes or Factice

Amberex ..... lb.	.15	@	
Black ..... lb.	.08	@	.12
Brown ..... lb.	.08	@	.13
White ..... lb.	.09	@	.15

Softeners

Burgundy pitch ....100 lbs.	6.00	@	
Atlas ..... 100 lbs.	6.50	@	
Corn oil, crude..... lb.	.09	@	
Cottonseed oil (P. S. Y.). lb.		@	
Cycline oil ..... lb.	.25	@	.34
Degras ..... lb.	.04	@	.04½
Fluxol ..... ton	18.00	@	80.00
Fluxrite (fluid) ..... lb.		@	
Palm oil (Lagos)..... lb.	.05¾	@	.06
(Niger) ..... lb.	.05⅛	@	.05¼
(Witco) ..... lb.		@	
Para-flux ..... gal.	.15	@	.17
Petrolatum, snow white... lb.	.08	@	.08⅛
Pigmentar ..... gal.	.18	@	.23
Pigmentaroil (tank cars, factory) ..... gal.	.18	@	.23
(bbls., drums) ..... gal.		@	
Pine oil, dest distilled.. gal.	.54	@	.55
Pine pitch ..... bbl.	7.00	@	
Pine tar (retort)..... gal.	.22	@	.25
Rosin K (bbls.)....280 lbs.	5.70	@	
Rosin oil, compounded.. gal.		@	
No. 3, deodorized..... gal.	.57	@	

Softeners *(Continued)*

No. 556, deodorized... gal.	$0.48	@	
Rubberseed, drums ..... lb.	.09½	@	.10
Rubtack ..... lb.		@	
Tackol ..... lb.	.09	@	.18
Tonox ..... lb.		@	
Witco No. 20 ..... gal.		@	
Woburn oil ..... lb.	.05½	@	.06
Wobonite No. 94..... lb.	.03½	@	

Solvents

Benzol (90% drums)... gal.	.26	@	
Carbon bisulphide (drums). lb.	.05½	@	.12
tetrachloride (drums)... lb.	.06½	@	.12
Dip-Sol ..... gal.	.12	@	
Dryolene, No. 9..... gal.	.09½	@	
Gasoline			
No. 303			
Drums, (c. l.) .... gal.	.20	@	
Tank cars ..... gal.	.16	@	
Petrobenzol ..... gal.	.13	@	
Rub-Sol ..... gal.	.07½	@	
Solvent naphtha (tanks). gal.	.28	@	
Stod-Sol ..... gal.	.09	@	
Troluoil ..... gal.	.13	@	
Turpentine, Venice ..... lb.	.20	@	
dest distilled ..... gal.	.35	@	

Stabilizers

Laurex, ton lots..... lb.		@	
Stearates			
Aluminum ..... lb.	.26	@	.27
Calcium ..... lb.	.26	@	.27
Magnesium ..... lb.	.28	@	.29
Zinc ..... lb.	.27	@	.28
Stearex ..... lb.	.11	@	.15
Stearic acid, dbl. press.. lb.	.16	@	.18

Vulcanizing Ingredients

Sulphur			
Rubber sulphur...100 lbs.	1.75	@	2.50
Soft rubber (c.l.)..100 lbs.		@	
(l.c.l.) ..... 100 lbs.		@	
Sulphur chloride ..... lb.	.03½	@	.04
Superfine commercial flour (bbls.) ..... 100 lbs.	2.55	@	3.10
(bags) ..... 100 lbs.	2.20	@	2.80
Tire brand, superfine, 100 lbs.	1.75	@	
Tube brand, velvet. 100 lbs.	2.30	@	
Velvet flour (240 lb. bbls.) ..... 100 lbs.	2.95	@	3.50
(150 lb. bags)..100 lbs.	2.60	@	3.15
Vandex ..... lb.		@	
(See also Colors—Antimony)			

Waxes

Beeswax, white, commercial ..... lb.	.55	@	
carnauba ..... lb.	.33	@	
ceresin, white ..... lb.	.12½	@	
montan ..... lb.	.06½	@	
ozokerite, black ..... lb.	.28	@	
green ..... lb.	.28	@	
Paraffin			
122/124, crude, white scale ..... lb.	.03¼	@	
124/126 crude, white scale ..... lb.	.03¼	@	
125/127 fully refined... lb.	.04¼	@	

Miscellaneous Supplies

Bentonite (dispersion clay) ..... lb.	.02½	@	.03
Sponge paste ..... lb.	.30	@	

Reported Rubber Stocks

Long Tons

Producing Centers	Apr.	May	June	July	Aug.	Sept.
	1930					
Singapore	34,005	33,302	31,486	31,783	33,375	29,040
Penang	5,575	5,272	4,467	5,106	6,154	5,317
Para	3,596	3,349	3,347	3,472	3,381	3,357
Totals	43,176	41,923	39,300	40,361	42,910	37,714
Manufacturing Centers						
London	74,676	77,312	80,260	81,048	80,656	83,304
Liverpool	23,849	25,415	27,332	28,291	29,789	35,500
Amsterdam	2,204	2,308	2,316	2,312	2,197	†
United States.....	150,199	151,049	155,000	158,445	162,283	171,285
Plantations afloat*.	85,875	85,835	75,480	84,129	82,805	†
Totals	336,803	341,919	340,388	354,225	357,730	.....
Grand totals....	379,979	383,842	379,688	394,586	400,640	.....

* W. H. Rickinson & Son, *The World's Rubber Position.*
† Not available.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

On September 30 Stocks of Rubber Held in Colombo Were Reported as 5,834 tons, comparing with 3,856 tons, June 30, and 5,695 tons, September 30, 1929, according to cabled report.

World Rubber Shipments—Net Exports

Long Tons

British Malaya	Calendar Years 1928	1929	1930 June	July	Aug.	Sept.
Gross Exports	409,500	579,524	36,657	41,347	47,982	49,365
Imports	149,787	161,612	12,120	12,759	10,304	8,087
Net	259,713	417,912	24,537	28,588	37,678	41,278
Ceylon	57,271	80,795	4,152	4,619	6,779	7,920
India and Burma	10,790	11,720	778	792	600	†
Sarawak	10,087	11,079	1,040	1,087	740	†
British No. Borneo.....	6,698	7,381	*450	*600	*500	†
Siam	4,813	5,024	392	327	335	†
Java and Madura	58,848	66,010	4,728	6,022	5,982	†
Sumatra E. Coast	82,511	87,589	4,776	5,891	7,197	†
Other N. E. Indies	121,671	134,732	9,512	9,770	9,520	†
French Indo-China	9,616	10,147	425	648	394	527
Amazon Valley	21,129	21,148	974	810	809	1,093
Other America	1,499	996	83	80	*75	†
Mexican Guayule	3,076	1,275	168	93	50	†
Africa	6,124	4,596	*300	*250	*250	100
Totals	653,837	860,404	52,315	59,577	70,909	.....

* Estimate. † Not available. *Compiled by Rubber Division, Washington, D. C.*

New York Quotations

October 27, 1930

Drills

38-inch 2.00-yard	*yard*	$0.11½@
40-inch 3.47-yard		.06⅝@
50-inch 1.52-yard		.16 @
52-inch 1.90-yard		.12 @
52-inch 2.20-yard		.10½@
52-inch 1.85-yard		.12⅞@

Ducks

38-inch 2.00-yard D. F.	*yard*	.12 @
40-inch 1.45-yard S. F.		.17 @
72-inch 1.05-yard D. F.		.26 @
72-inch 16.66-ounce		.29 @
72-inch 17.21-ounce		.30½@

MECHANICAL

Hose and belting	*pound*	.26½@

TENNIS

52-inch 1.35 yard	*yard*	.18¾@

Hollands

RED SEAL

36-inch	*yard*	.13 @
40-inch		.14 @
50-inch		.19½@

GOLD SEAL

40-inch, No. 72	*yard*	.16½@
40-inch, No. 80		.18 @

Osnaburgs

40-inch 2.35-yard	*yard*	.10 @
40-inch 2.48-yard		.09⅜@
40-inch 3.00-yard		.08 @
40-inch 10-oz. part waste		.12 @
40-inch 7-oz. part waste		.08½@
37-inch 2.42-yard		.09⅞@

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	.09¾@
Bombazine 60 x 48		.08¾@
Plaids 60 x 48		.11 @
Plaids 48 x 48		.10 @
Surface prints 64 x 60		.11¾@
Surface prints 60 x 48		.11 @
Print cloth, 38½-in., 60 x 48		.05 @
Print cloth, 38½-in., 64 x 60		.05½@

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.08½@
48 x 48, 2.85-yard		.07½@
64 x 68, 3.15-yard		.08½@
56 x 60, 3.60-yard		.07¼@
44 x 48, 3.75-yard		.06¼@
44 x 40, 4.25-yard		.05⅝@

Sheeting, 36-inch

48 x 48, 5.00-yard	*yard*	.05 @
44 x 40, 6.15-yard		.04 @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Peeler, karded	*pound*	.38 @

BUILDER 23/11

Peeler, karded	*pound*	.38 @

BUILDER 10/5

Peeler, karded	*pound*	.35 @

CORD 23/5/3

Peeler, karded	*pound*	.38 @

CORD 23/4/3

Peeler, karded	*pound*	.40 @

CORD 23/3/3

Peeler, karded	*pound*	.42 @

CORD 15/3/5

Peeler, karded	*pound*	.36 @

CORD 13/3/3

Peeler, karded	*pound*	.35 @

LENO BREAKER

8-oz. Peeler, karded	*pound*	.38 @
10-oz. Peeler, karded		.38 @

CHAFER

9.5 oz. Peeler, karded	*pound*	.40 @
12-oz. Peeler, karded		.39 @
14-oz. Peeler, karded		.38 @

Cotton and Fabrics

THE temptation is strong to "call the turn" in any market, and the action of cotton in the past month has revealed many favorable factors on which to base such a prediction. One prominent dealer has been urging people to purchase cotton for several weeks; and with cotton over 11 cents on all deliveries, from a low of below 10 cents, their advice has been of the soundest.

Heavy buying has been a strong support of cotton prices. Evidently spinners took advantage of the low prices and purchased cotton to supply their needs for some time to come. Coincident with the increase in buying activity, the Census Bureau announced a sharp recovery in spinning activity. During September mills operated on a 76.4 per cent capacity as compared with 65.2 per cent in August. The report of the Association of Cotton Textile Merchants of New York for September was also of a bullish nature with a decrease of 11.4 per cent in the stocks on hand.

COTTON BULL POINTS

1. Sales during September were 160.1 per cent of production; shipments were 127.7 per cent of production; stocks on hand showed a decrease of 11.4 per cent; unfilled orders on September 30 showed an increase of 26.1 per cent.
2. Cotton mills continue an irregular but definite upward trend, according to the New York Cotton Exchange Service.
3. The cotton spinning industry for September operated on a 76.4 per cent capacity, on a single shift basis, as compared with 65.2 per cent during August of this year.
4. Cotton gray goods sales continue satisfactory.
5. Domestic consumption for September was 394,321 bales of lint and 62,796 bales of linters, compared with 352,335 of lint and 57,010 of linters in August of this year.
6. The Federal Farm Board will not repeat last year's market operations.
7. Plans provide for advance loans by banks to cotton growers on a basis of reduced acreage and for withholding from the market a part of this year's crop.
8. Efforts are being made to reduce cotton acreage for next year.
9. Exports for first two months of cotton season this year were 1,268,992 bales against 951,894 bales in the same period last year.

COTTON BEAR POINTS

1. Large supply of cotton is controlled by the Farm Loan Board.
2. Staple points are lower as result of drought.
3. Domestic consumption of cotton for first eight months of 1930 was 23 per cent less than in the same period in 1929.
4. The supply of cotton is nearly 50 per cent in excess of probable world consumption.
5. Cotton ginned from the growth of 1930 prior to October 18 was announced by the Census Bureau to have totaled 9,252,011 running bales as compared with 9,094,704 last year.

The Farm Board is receiving a good deal more cooperation than in previous years, and its efforts to reduce the acreage for next year may prove successful. The Board's new financial policy is considered sound. Although it holds a large supply of cotton, growers have been assured that it will not be dumped on the market. Gray goods continue to sell satisfactorily, and with spinners working at an increased pace, cotton is in as favorable a condition, if not more so, than any of the other commodities.

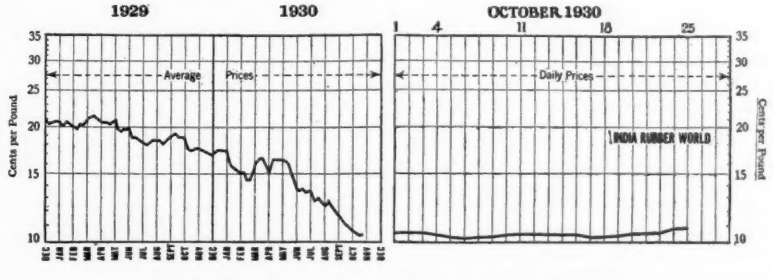
Week ended September 27: Increased hedging operations in the first part of the week started the market on its downward course during this week. The continued slump, however, which sent cotton to prices that have not been equaled for fifteen years, was attributed to outside factors. At New Orleans traders believe that cotton reacted in sympathy with the grain and stock markets. Final prices were the lowest of the year, with July cotton the only delivery that closed above 11 cents; December closed at 10.41-10.43.

Trade buying was strong both at home and abroad throughout the entire week, but the heavy new crop movement and the large number of hedging operations offset the salutary effect of better buying. The liquidation of the October position incident to the first notice day also contributed to the drop in prices. Tenders for October deliveries were not so large as in May and July and were absorbed by large spot interests.

American and foreign spinners, it is felt, are now inclined to believe that cotton will go higher rather than lower, and their increased buying activity is evidence of their belief and is making for a more healthy market. Prices at the close on September 27 follow:

Position	High	Low	Close	Previous Close
Oct.	10.26	10.20	10.25	10.30
Oct.	10.26	10.21	10.21	10.28
Dec.	10.55	10.45	10.47/48	10.57/58
Dec.	10.50	10.40	10.41/43	10.51/52
Jan.	10.65	10.51	10.51/52	10.67
Jan.	10.57	10.48	10.49	10.60
Mar.	10.77	10.68	10.69	10.80
May	11.00	10.88	10.89/90	11.01
July	11.15	11.03	11.03/04	11.16/17

Week ended October 4: After the October delivery broke through 10 cents on Tuesday, there was considerable covering. Week-end hedging, however, nullified the effect of the advance, and the net changes for the week were barely 5 points. At the 10-cent level a good many buying or-



Daily Prices of Spot Middling Upland Cotton

ders were in evidence, and the opinion of traders is that this price discounts almost all the unfavorable factors, including the larger governmental crop estimate.

As the day approaches for the next government crop report, private estimates are found to be closer to the figure given by the government than was the case last month. The region at Memphis is one exception. Here the crop has suffered considerably and gives evidence of being smaller than at first estimated.

Current prices have attracted foreign spinners and exports are at a favorable level. Domestic spinners are finding a broader demand for cotton goods, and an Alabama spot firm says that warehouses are rapidly becoming filled everywhere in the South, while large stocks are being held back on plantations. It is expected that many uses that were out of the question at higher levels will be found for the cheaper cotton.

The weekly statistics were considered bearish. Mill takings were slightly larger than in the preceding week, but smaller than in the corresponding week last year. The movement of the crop into sight continued heavy. Port stocks, despite large exports, continued to be almost twice as large as those of a year ago, and interior town stocks are also much heavier.

The weakness in wheat and stocks contributed to cotton's decline, but the steadier tone apparent in both of these after the speeches of President Hoover, will remove a depressing obstruction to the upward course of cotton. Prices at the close on October 4 were:

Position	High	Low	Close	Previous Close
Oct.	.....	.....	10.19	10.35
Oct.	10.35	10.21	10.21	10.37/38
Dec.	10.54	10.44	10.44	10.61
Dec.	10.56	10.42	10.42/43	10.58/60
Jan.	10.62	10.60	10.51	10.70
Jan.	10.66	10.50	10.50	10.66/68
Mar.	10.84	10.71	10.71/72	10.84/85
May	11.03	10.90	10.90/91	11.03/04
July	11.19	11.05	11.05/06	11.18

Week ended October 11: Preceding the government report issued on Wednesday, the cotton market witnessed considerable nervous liquidation, with traders expecting an estimate of at least 250,000 bales above the forecast of September. The December option had dropped to 10.12, but when an indicated crop of 14,486,000 bales was announced, an increase of only 146,000 bales over the previous estimate, the market started an advance that sent it 25 points higher.

Ginning to October 1, reported at the same time, reached 6,304,608 bales and were large by comparison with the previous year. The figures, however, were regarded as bullish because they, like the crop estimate, were smaller than expected. The ginnings from September 16 to October 1 were about the same as for the corresponding period last year.

The only obstruction to getting the crop to market is reported from Memphis where pickers are complaining of the wages, and there may be a heavier than usual abandonment of cotton. Elsewhere the roads are good, and cotton is moving as it is picked.

The Association of Cotton Textile Merchants of New York reported that production during September was 32.1 per cent less than in September, 1929; sales

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Sept. 27	10.52
Oct. 4	10.41
Oct. 11	10.26
Oct. 18	10.30
Oct. 25	10.73

were 160.1 per cent of production; shipments were 127.7 per cent of production; stocks on hand at the end of the month decreased 11.4 per cent; and unfilled orders on September 30 increased 26.1 per cent for the month. As a result of the continued low production, stocks were reduced more than 50,000,000 yards during September. This reduction is the greatest —both in yardage and percentage—recorded in any month since these statistics have been compiled. Prices on October 11 were:

Position	High	Low	Close	Previous Close
Oct.	.....	.....	10.27	10.17
Oct.	10.33	10.29	10.32	10.20
Dec.	10.53	10.50	10.55	10.40
Dec.	10.53	10.43	10.52/53	10.39/40
Jan.	.....	.....	10.63	10.50
Jan.	10.64	10.53	10.63/64	10.50
Mar.	10.85	10.76	10.83/85	10.70/73
May	11.03	10.94	11.01/02	10.88/89
July	11.21	11.12	11.18/21	11.05/07

Week ended October 18: The influence of the weather on the price of cotton was nullified by the unsettlement in the stock market and lower commodity prices. At Memphis it was felt that the frost in the central belt as predicted by various weather bureaus, with temperatures down in the low 40's, would do serious damage to bolls exposed by leaf worm damage in north Mississippi and eastern Arkansas, for these bolls form the only remnant of the cotton not fully matured. Many bolls of cotton are not yet opened in the fields in these two states.

In spite of outside influences cotton held its own during the week, and many traders are inclined to believe that the turn is in sight. The only bar to an upturn appears to be the large stocks that have accumulated at American ports and at leading interior towns. The large supply of cotton controlled by the Farm Loan Board through cooperative organizations also serves as a check to improvement in prices.

On Wednesday the Census Bureau announced that the cotton consumed during September was 394,321 bales of lint and 62,798 bales of linters, compared with 352,335 of lint and 57,010 of linters in August of this year, and 545,834 of lint and 81,894 of linters in September of last year.

In the two completed months of the cotton year consumption by the home mills has been 746,656 bales, against 1,103,762 bales in the same period last year. Exports during the two months have been 1,268,992 bales, against 951,894 bales a year ago. Prices on October 18 closed as follows:

Position	High	Low	Close	Previous Close
Oct.	.....	.....	10.17	10.16
Oct.	10.15	10.10	10.13	10.10
Dec.	10.34	10.30	10.31	10.33
Dec.	10.35	10.28	10.32/33	10.33/34
Jan.	10.48	10.42	10.43	10.45
Jan.	10.47	10.41	10.43/44	10.45
Mar.	10.72	10.64	10.68/69	10.66/67
May	10.93	10.83	10.88/89	10.86/87
July	11.11	11.03	11.07/10	11.06

Week ended October 25: Under the stimulus of strong trade activity cotton gained over $3.50 a bale on the general contract, with some deliveries up as much as $5 a bale. The factor that served to pull cotton out of its lethargy was the report of the Census Bureau early in the week. American mill consumption for September showed improvement, and the figures showing the percentage of mill operations and the record-breaking exports for the month completed the good work which had started cotton on its turn. September exports showed 902,000 bales of cotton, as compared with 356,000 in August and 725,000 for September last year. These figures were the largest for any September since 1913. Consumption by American mills for September was reported at 394,321 bales, against 352,835 for August and 545,000 for September, 1929.

The operations of the country's cotton mills were on the basis of 76.4 per cent of normal for September, as compared with 65.2 for August.

Other encouraging figures were published on October 25. Cotton ginnings up to October 18 were announced by the Census Bureau to have totaled 9,252,011 running bales, as compared with 9,094,704 running bales to the same date last year, and only 8,151,271 bales in 1928. Prices at the close on October 25 were:

Position	High	Low	Close	Previous Close
Dec.	11.11	11.02	11.04/09	10.95/98
Dec.	11.14	10.96	11.03/05	10.94/96
Jan.	11.16	11.08	11.12	11.07
Jan.	11.24	11.10	11.18/19	11.07/09
Mar.	11.48	11.30	11.39	11.29
May	11.70	11.52	11.61/65	11.51/52
July	11.89	11.69	11.81	11.70/71

On October 27 the New York market for spot cotton was steady at 11¼ cents for middling uplands. That the strength shown by the market will induce a broader demand, greater confidence, and higher prices is gaining general acceptance in cotton trade circles.

Cotton Fabrics

DUCKS, DRILLS, and OSNABURGS. The demand for these fabrics has displayed increasing activity in October. Contracts for spring deliveries are being placed, while prices continue decidedly in the buyer's favor. Cotton of good grade and length of staple is rising to a premium; therefore it is expected that fabrics will advance also under quickened demand.

RAINCOAT FABRICS. The raincoat business is very quiet owing to the lack of rainy weather. A few days of rain would greatly stimulate the movement of goods.

SHEETINGS. In recent weeks the demand for print cloths for delivery this year has been excellent, exceeding in volume that of any corresponding period of this year. Sheetings have been active in a smaller way. Prices are firm, but it is not necessary to undercut the market in the slightest to make sales. The present is a time when grey goods have moved irrespective of the attitude of raw cotton.

TIRE FABRICS. The market for tire fabrics in October was generally very quiet and unchanged, the demand was chiefly for American cotton for early delivery in light quantities. The mills are quoting quite firmly with a slightly stronger tendency in Americans by some centers.

1929 Census

Rubber Tires and Inner Tubes

THE Bureau of the Census announces that, according to data collected in the Census of Manufactures taken in 1930, the total shipments or deliveries of rubber tires and inner tubes in 1929 by manufacturers in the United States engaged primarily in the production of these commodities were valued at $682,772,494, a decrease of 12.4 per cent as compared with $779,533,129 reported for 1927, the last preceding census year.

In addition, rubber tires and inner tubes valued at $475,318 were made as secondary products by establishments engaged primarily in other lines of manufacture. The addition of these figures to those representing shipments or deliveries by establishments classified in the industry gives a total of $683,247,812. The numbers and the values of the principal classes of products for 1929, in comparison with 1927, are as follows: Casings for motor vehicles, except motorcycles, 1929, 69,807,118, valued at $578,491,756; 1927, 63,549,949, valued at $633,582,246. Inner tubes for motor vehicles, except motorcycles, 1929, 73,292,475, valued at $81,920,919; 1927, 70,855,455, valued at $105,487,386. Casings and tubes for motorcycles and bicycles, 1929, 3,567,824, valued at $3,490,523; 1927, 3,046,260, valued at $3,695,399. Solid and cushion tires for motor vehicles, 1929, 593,376, valued at $18,197,839; 1927, 812,548, valued at $34,985,419.

The statistics for 1929 are summarized in the following tables, with comparative figures for 1927. The figures for 1929 are preliminary and subject to revision.

TABLE 1. SUMMARY FOR THE INDUSTRY, 1929 AND 1927

	1929	1927	Per Cent of Increase or Decrease (—)
Number of establishments	91	109	—16.5
Wage earners (average for the year)*	83,015	78,256	6.1
Wages†	$126,782,001	$120,063,854	5.6
Cost of materials, fuel and purchased electric current†, ‡	$431,189,902	$499,220,642	—13.6
Products, total value†	$776,703,565	$869,688,063	—10.7
Tires and inner tubes	$682,772,494	$779,533,129	—12.4
Other products	$93,931,071	$90,154,934	4.2
Value added by manufacture§	$345,513,663	$370,467,421	—6.7

*Not including salaried employes. The average number of wage earners is based on the numbers reported for the several months of the year. This average somewhat exceeds the number that would have been required for the work performed if all had been continuously employed throughout the year, because of the fact that manufacturers report the numbers employed on or about the 15th day of each month, as shown by the payrolls, usually taking no account of the possibility that some or all of the wage earners may have been on part time or for some other reason may not actually have worked the entire week. Thus in some cases the number reported for a given month exceeds the average for that month.

†Manufacturers' profits cannot be calculated from the census figures because no data are collected for certain expense items, such as interest on investment, rent, depreciation, taxes, insurance, and advertising.

‡The cost-of-materials item for 1927 is not strictly comparable with the corresponding item for 1929 because of the fact that the schedule for 1927 provided for the inclusion of data on the cost of shop supplies, whereas that for 1929 stated that such data should not be included here.

§Value of products less cost of materials, fuel, and purchased electric current. The figures for 192' are not strictly comparable with those for 1929 because of the change in the cost-of-materials item. (See footnote ‡.)

TABLE 2. RUBBER TIRES AND INNER TUBES—PRODUCTION, BY KIND, QUANTITY, AND VALUE, 1929 AND 1927

	1929	1927
Rubber tires and inner tubes made in all industries, total value	$683,247,812	$779,533,129
Made in the tire and tube industry, value	$682,772,494	$777,668,671
Made as secondary products in other industries, value	$475,318	$1,864,458
Pneumatic:		
Motor-vehicle, except motorcycle		
Casings		
Total number	69,807,118	63,549,949
Total value	$578,491,756	$633,582,246
Balloon		
Number	50,787,228	32,786,832
Value	$379,191,865	$326,062,731
High pressure		
Number	19,019,890	30,763,117
Value	$199,299,891	$307,519,515
Inner tubes		
Total number	73,292,475	70,855,455
Total value	$81,920,919	$105,487,386
Balloon		
Number	49,217,901	33,642,868
Value	$53,381,006	$52,193,080
High-pressure		
Number	24,074,574	37,212,587
Value	$28,539,913	$53,294,306
Motorcycle and bicycle		
Casings and tubes		
Total number	3,567,824	3,046,260
Total value	$3,490,523	$3,695,399
Casings		
Number	319,318	434,712
Value	$839,666	$1,159,510
Inner tubes		
Number	329,074	351,367
Value	$182,468	$210,444
Single-tube tires		
Number	2,919,432	2,260,181
Value	$2,468,389	$2,325,445
Other casings and tubes, value	$241,738	$109,758
Solid and cushion:		
Motor-vehicle		
Number	593,376	812,548
Value	$18,197,839	$34,985,419
Other, including carriage and other tiring value	$905,037	$1,672,921

Ceylon

(*Continued from page 94*)

the interests of the peasantry. It is clear now that exploitation of this kind is prejudicial even to the industries concerned. A cogent argument against restriction is that an artificially maintained price of rubber would absorb more land for the cultivation of the product than the economic conditions of the industry justify."

Indo-China

French rubber growers in Indo-China are petitioning the French Government to put on an increased customs duty of from two to four francs per kilo on all crude rubber imported from other countries, thus giving preference to French-grown rubber.

The situation is one of difficulty for those asked to find a solution. For on the one hand France imports about 40,000 tons of rubber annually, of which 5,000 to 6,000 tons only are supplied by her own colonies; on the other, the big tire manufacturers who are the chief consumers of French-Indo-China rubber are said to have large interests in the leading Indo-China rubber companies. It is understood that it was, in the first instance, at the suggestion of these manufacturers that the French Government granted important subsidies to the French plantation companies in Indo-China.

The only way of recovering the amount granted in subsidies would be by putting on an additional protective duty, but this would have the undesirable effect of raising the price of rubber goods to French consumers.

Australia

A report from Melbourne states that three electrical companies, the Australian General Electric Co., Ferguson, Pailin, Ltd., and the Metropolitan-Vickers Australian Proprietary, Ltd., have combined for manufacturing purposes. Each of the companies will retain its identity in regard to brands and will have separate sales organizations. The new company, to be known as the Australian Manufacturing Co., will have a capital of £800,000.

With the object of assisting the establishment of a rubber manufacturing industry in Queensland, the government of that state has approved of the exemption from income tax for a period of five years of the Renown Rubber Co., Ltd. The company has a nominal capital of £1,000,000.

A new company, known as the Hoskings Products, Ltd., has been formed at Sydney with a nominal capital of £50,000, to manufacture and sell rubber goods and to acquire an invention for rejuvenating and reclaiming soft rubber.

The process patented by L. C. Neale for manufacturing printers' ink from old automobile tires, is to be exploited by a company in Melbourne, which will acquire the Australian patent rights. The new concern has been incorporated with a capital of £50,000 divided into 50,000 shares of £1 each. The directors are W. A. Watt, Harold E. Cohen, L. C. Neale, and H. W. Gepp.

It is claimed that satisfactory inks can be made from old automobile tires, rubber scrap, tire strippings, buffings, waste oil, and other ingredients, and as proof the company's prospectus has been printed with the new ink.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

NUMBER	SPECIAL CIRCULARS
2795	Canadian Tire Exports, July, 1930.
2797	Review of Syrian Tire Market.
2799	British Exports of Footwear, July, 1930.
2800	British Exports of Automobile Casings, July, 1930.
2816	Belgian Tire Exports, May, 1930.
2817	Belgian Tire Exports, June and Six Months Ended June, 1930.
2818	Belgian Tire Exports, July, 1930.
2819	German Tire Exports, July, 1930.
2820	Canadian Tire Exports, August, 1930.
2824	British Exports of Automobile Casings, August, 1930.
2825	British Exports of Footwear, August, 1930.

Imports, Consumption, and Stocks

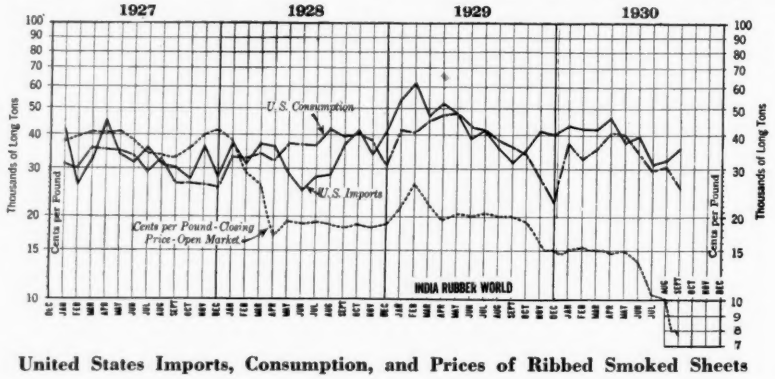
IMPORTATIONS of crude rubber have exceeded consumption by a liberal margin every month of this year except in May. In consequence stocks are at record height in the United States and a similar condition prevails in the case of the combined foreign stocks.

In September domestic imports rose nearly 5,000 tons over those for August; while consumption in September was 5,000 tons less than in August. Thus the record of domestic stocks on hand at the end of September reached 169,927 tons. By the end of October this stock may reach 185,000 tons because tire production schedules are not being enlarged at present.

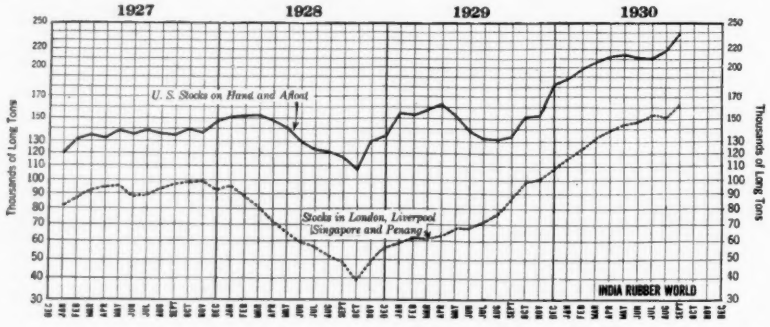
Tire factories in the Akron section are operating on very conservative schedules to avoid burdening their inventories previous to the customary revival of production following the beginning of the new year. Should October consumption reach 22,000 tons, the total consumption for the first 10 months will be approximately 327,000 tons; while for the corresponding period of last year the total rubber consumption was 417,900 tons.

Reliable brokers estimate October imports at 40,000 tons and October consumption at 23,000 tons. The same authority estimates rubber afloat to the United States at 60,000 tons and stocks on hand in the United States at 185,000 tons.

In general the consumption of rubber during October of any year shows little if any increase over the previous month.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets



United States, British, and Malayan Rubber Stocks

London, Liverpool, Singapore and Penang stocks totaled 40,000 tons in October, 1928. In the two years intervening the combined stocks at these ports accumulated steadily and now approximate 165,000 tons. London and Liverpool stocks follow:

LONDON STOCKS

Week Ended	Tons
September 27	83,136
October 4	81,544
October 11	82,245
October 18	83,102
October 25	82,218

LIVERPOOL STOCKS

Week Ended	Tons
September 27	34,858
October 4	36,378
October 11	37,224
October 18	37,211
October 25	38,345

United States Statistics of Rubber Imports, Consumption, and Stocks

Twelve Months	*Net Imports Tons	Consumption Tons	Stocks on Hand Tons	Stocks Afloat Tons	Total Domestic Stocks Tons	British and Malayan Stocks: London & Liverpool Tons	British and Malayan Stocks: Singapore & Penang Tons	British and Malayan Stocks: Total Tons
1925	385,596	388,000	50,985	52,421	103,406	6,328	18,840	25,168
1926	399,972	366,000	72,510	51,238	123,748	51,320	26,443	77,763
1927	403,472	373,000	100,130	47,938	148,068	66,261	25,798	92,059
1928	407,572	437,000	66,166	68,764	134,930	22,603	32,905	55,508
1929	527,327	464,644	105,138	62,389	167,527	73,253	35,548	108,801
1930								
January	44,093	36,669	126,068	61,863	187,931	81,300	33,468	114,768
February	41,373	32,726	134,790	63,404	198,194	87,100	37,550	124,650
March	42,339	35,914	141,843	63,646	205,489	93,500	38,129	131,629
April	46,997	40,207	148,272	63,261	211,533	99,870	39,880	139,750
May	37,790	39,902	146,179	68,168	214,347	102,936	41,253	144,189
June	39,761	34,643	151,551	58,658	210,209	108,203	39,033	147,236
July	30,970	29,245	152,001	58,326	210,327	108,704	45,459	154,163
August	31,643	30,575	158,604	61,168	219,772	112,989	48,132	161,121
September	36,498	25,288	169,927	60,924	230,851	117,922	44,015	161,937

*Including liquid latex, but not guayule.

United States Crude and Waste Rubber Imports for 1930 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1930	Total 1929	Balata	Miscellaneous	Waste
January ..... tons	46,042	362	747	76	10	125	...	47,362	52,305	127	748	35
February	42,510	275	788	66	14	75	...	43,728	64,538	130	543	144
March	44,002	332	894	37	15	150	...	45,430	53,824	123	738	20
April	48,727	179	881	53	12	75	...	49,927	54,171	87	628	107
May	39,620	444	530	...	1	150	...	40,745	49,180	109	909	87
June	41,631	314	492	...	128	88	...	42,653	44,490	127	829	2
July	33,207	193	489	36	...	159	...	34,084	44,252	104	525	11
August	33,558	621	346	26	7	...	...	34,558	38,292	39	949	30
September	38,304	476	508	27	2	150	...	39,467	32,515	119	748	22
Total nine months, 1930 ..... tons	367,601	3,196	5,675	321	189	972	...	377,954	.....	965	6,617	458
Total nine months, 1929 ..... tons	*423,774	....	8,627	276	316	561	13	.....	433,567	723	9,616	2,339

* Latex included.

Compiled from Rubber Manufacturers Association statistics.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	June, 1930		Three Months Ended June, 1930	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.	5,777,423	$801,962	16,745,343	$2,426,875
Rubber, recovered	1,344,200	78,422	3,920,800	226,184
Rubber and gutta percha scrap	360,000	13,963	1,236,100	35,302
Balata	264	79	13,924	5,569
Rubber substitutes	63,300	11,701	118,300	16,965
Totals	7,545,187	$906,127	22,034,467	$2,710,895
PARTLY MANUFACTURED				
Hard rubber sheets and rods	6,775	$2,703	30,723	$12,771
Hard rubber tubes	.....	.....	.....	1,240
Rubber thread not covered	14,465	12,380	48,015	42,209
Totals	21,240	$15,083	78,738	$56,220
MANUFACTURED				
Belting	.....	$11,727	.....	$41,188
Hose	.....	18,011	.....	52,738
Packings	.....	5,640	.....	19,975
Boots and shoes.....*pairs*	2,243	2,151	8,492	10,302
Clothing, including waterproofed	.....	30,087	.....	100,300
Gaskets	.....	3,955	.....	8,069
Gloves	.....	2,085	.....	5,552
Hot water bottles	.....	682	.....	1,987
Tires, bicycle.....*number*	9,716	4,263	15,410	6,998
Pneumatic.....*number*	4,977	40,473	9,745	86,958
Inner tubes.....*number*	3,866	4,418	6,083	7,819
Solid for automobiles and motor trucks....*number*	61	1,345	227	5,024
Other solid tires	.....	689	.....	8,461
Mats and matting	.....	6,267	.....	33,617
Cement	.....	3,187	.....	14,362
Golf balls.....*dozen*	9,177	22,123	24,235	62,148
Heels .....*pairs*	165,197	5,631	337,285	11,504
Other rubber manufactures	.....	113,291	.....	332,468
Totals	.....	$276,025	.....	$809,470
Totals, rubber imports	.....	$1,197,235	.....	$3,576,585

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$9,225	.....	$31,581	.....
Totals	$9,225	.....	$31,581	.....
MANUFACTURED				
Belting	$52,010	.....	$138,706	.....
Canvas shoes with rubber soles	310,397	.....	1,290,212	.....
Boots and shoes	98,783	.....	224,080	.....
Clothing, including waterproofed	4,697	.....	10,414	.....
Hose	18,715	.....	53,386	.....
Tires, bicycle	1,224	.....	1,425	.....
Pneumatic	1,036,330	.....	3,356,771	.....
Inner tubes	126,194	.....	412,955	.....
Solid	708	.....	1,987	.....
Other rubber manufactures	241,757	$2,084	889,796	$10,132
Totals	$1,890,815	$2,084	$6,379,732	$10,132
Totals, rubber exports	$1,900,040	$2,084	$6,411,313	$10,132

Crude Rubber Imports by Customs Districts

Including latex, dry rubber content

	August, 1930		August, 1929	
	Pounds	Value	Pounds	Value
Massachusetts	2,730,685	$327,928	3,532,222	$682,193
New York	70,800,495	8,530,431	62,648,019	12,539,065
Philadelphia	.....	.....	1,236,199	235,925
Maryland	92,575	9,910	1,343,594	268,027
Georgia	528,195	62,494	.....	.....
Los Angeles	6,986,433	845,207	8,258,252	1,595,932
San Francisco	167,068	20,253	186,507	35,963
Oregon	.....	.....	22,407	4,217
Washington	.....	.....	26,695	5,385
Michigan	.....	.....	144,164	29,914
Ohio	582,401	98,687	7,052,833	1,366,999
Colorado	224,000	24,579	336,000	66,932
Totals	82,111,852	$9,919,489	84,786,892	$16,830,552

London Stocks, August, 1930

	Landed for Aug. Tons	Delivered for Aug. Tons	Stocks August 31 1930 Tons	1929 Tons	1928 Tons
LONDON					
Plantation	5,064	5,195	80,839	35,498	31,972
Other grades	30	31	47	54	85
LIVERPOOL					
Plantation	†2,187	†808	†29,670	†7,507	†2,280
Total tons, London and Liverpool	7,281	6,034	110,556	43,059	34,337

† Official returns from the recognized public warehouses.

World Rubber Absorption—Net Imports

Long Tons

	Calendar Years		1930			
CONSUMPTION	1928	1929	May	June	July	Aug.
United States	441,400	472,000	39,902	34,633	29,340	30,675
United Kingdom	48,504	72,023	5,660	4,780	5,903	7,263
NET IMPORTS						
Australia	8,430	15,886	64	67	84	265
Austria	3,043	3,324	274	423	130	224
Belgium	7,958	9,445	1,254	691	939	888
Canada	30,447	35,453	2,593	2,579	3,347	2,108
Czechoslovakia	3,138	4,650	346	282	343	‡
Denmark	566	799	21	129	80	143
Finland	768	976	96	56	99	102
France	36,498	59,342	5,233	4,458	3,311	3,953
Germany	37,855	49,078	4,379	3,794	3,449	3,515
Italy	12,433	17,169	1,279	1,382	197	886
Japan	25,621	34,284	2,699	2,677	1,206	2,170
Netherlands	2,243	3,022	230	343	172	37
Norway	728	813	57	58	30	86
Russia	15,134	12,626	1,677	1,454	‡	‡
Spain	.....	2,400	*200	*200	*200	‡
Sweden	2,356	3,857	100	263	547	416
Switzerland	566	653	67	85	86	63
Others estimated†	8,000	.....	.....	.....	.....	.....
Grand totals	685,688	797,800	66,131	58,354	.....	.....
Minus United States	441,400	472,000	39,902	34,633	29,340	30,675
Total foreign	244,288	325,800	26,229	23,721	.....	.....

* Estimate to complete table. † Includes Argentina, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, Spain, and Union of South Africa. ‡ Not available.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Ceylon Rubber Exports

January 1 to July 31, 1930

To:	Tons
United Kingdom	9,239.84
Continent	4,161.04
Other countries in Europe	41.73
Australia	872.12
America	26,453.53
Canada and Newfoundland	2.50
Other countries in America	89.80
Egypt	9.00
Africa	6.38
India	56.45
Japan	211.31
Other countries in Asia	1.29
Total	41,144.99
For the same period last year	43,219.25

Annual Exports, 1922-1929

	Tons
For the year 1929	80,476.44
1928	57,825.48
1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for September, 1930:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham.

	September, 1930	
To:	Rubber Including Concentrated Latex Tons	Latex and Revertex Tons
United Kingdom	10,366	26
United States	26,644	84
Continent of Europe	7,219	24
British possessions	585	..
Japan	3,470	2
Other countries	109	..
Totals	48,393	136
Total Latex and Revertex	136	
Grand total	48,529	

Rubber Imports

Actual Imports by Land and Sea

	September, 1930	
FROM:	Dry Rubber Tons	Wet Rubber Tons
Sumatra	511	3,277
Dutch Borneo	299	2,119
Java and other Dutch islands	183	29
Sarawak	669	11
British Borneo	228	24
Burma	19	4
Siam	79	155
French Indo-China	377	15
Other countries	81	7
Totals	2,446	5,641

United States Statistics

Imports of Crude and Manufactured Rubber

	June 18 to June 30, 1930		January 1 to June 30, 1930	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	‡41,090,146	$5,640,696	‡594,002,735	$88,543,672
Jelutong or Pontianak	569,800	60,301	6,591,831	731,243
Balata	11,269	6,510	500,992	201,559
Gutta percha	.....	.....	113,210	19,831
Guayule	112,000	14,000	1,768,027	260,861
Siak, scrap and reclaimed	429,337	6,542	6,299,105	91,851
Totals	42,212,552	$5,728,049	609,275,900	$89,849,017
Chicle, crude—*Free*	734,488	369,416	.....	.....
MANUFACTURED—*Dutiable*				
Belting	.....	.....	6,355	3,666
Tires—*number*	5	40	3,485	57,407
Other rubber manufactures	.....	26,359	.....	711,459
Totals	.....	$26,399	.....	$772,532

	July, 1930		Seven Months Ended July, 1930	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	78,807,511	$10,553,944	667,523,970	$98,171,226
Liquid latex	542,691	78,688	5,828,967	1,005,078
Jelutong or Pontianak	906,647	102,325	7,498,478	833,568
Balata	53,539	17,463	554,531	219,022
Gutta percha	.....	.....	113,210	19,831
Guayule	208,000	26,000	1,976,027	286,861
Siak, scrap and reclaimed	903,965	11,182	7,203,070	103,033
Totals	81,422,353	$10,789,602	690,698,253	$100,638,619
Chicle—*Dutiable*	.....	.....	*8,733,245	†$4,470,252
Chicle, crude—*Free*	953,201	$475,127	†734,488	†$844,543
MANUFACTURED—*Dutiable*				
Tires—*number*	325	$2,123	3,810	$59,530
Other rubber manufactures	.....	71,839	.....	786,964
Totals	.....	$73,962	.....	$846,494

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	6,287,551	$759,260	45,771,993	$6,996,790
Balata	17,249	4,605	1,088,769	233,581
Gutta percha, rubber substitutes, and scrap	22,435	4,009	47,904	5,278
Rubber manufactures	.....	5,006	.....	126,261
Totals	.....	$772,880	.....	$7,361,910

Exports of Domestic Merchandise

MANUFACTURED				
Reclaimed	1,742,812	$97,770	14,121,390	$851,430
Scrap and old	2,889,153	90,549	31,299,641	1,203,230
Rubberized automobile cloth—*sq. yd.*	96,697	32,686	792,199	383,838
Other rubberized piece goods and hospital sheeting—*sq. yd.*	87,927	37,323	862,302	363,831
Footwear				
Boots—*pairs*	43,614	110,289	389,691	893,187
Shoes—*pairs*	263,421	324,964	926,805	969,418
Canvas shoes with rubber soles—*pairs*	198,457	122,896	2,739,706	1,833,470
Soles—*doz. pairs*	8,001	23,041	70,124	201,572
Heels—*doz. pairs*	81,452	62,126	696,874	481,450
Water bottles and fountain syringes—*number*	31,282	13,602	204,374	104,774
Gloves—*doz. pairs*	10,637	25,372	76,069	191,892
Other druggists' sundries	.....	24,103	.....	187,830
Balloons—*gross*	60,277	61,817	425,136	435,924
Toys and balls	.....	14,554	.....	75,667
Bathing caps—*doz.*	10,947	26,654	137,957	293,939
Bands	36,268	17,338	371,184	176,769
Erasers	37,197	23,026	308,620	189,643
Hard rubber goods				
Electrical goods	87,869	8,321	744,488	111,929
Other goods	.....	21,634	.....	227,775
Tires				
Truck and bus casings, *number*	34,513	743,107	254,916	5,845,681
Other automobile casings, *number*	142,339	1,230,278	1,280,815	11,179,621
Tubes, auto—*number*	125,167	207,806	979,006	1,665,017
Other casings and tubes, *number*	8,719	16,762	51,791	154,666
Solid tires for automobiles and motor trucks—*number*	1,566	52,110	16,749	525,520
Other solid tires	121,162	19,207	879,325	151,018
Tire accessories	.....	132,297	.....	829,202
Rubber and friction tape	133,591	36,421	899,228	246,173
Belting	338,374	176,314	2,886,950	1,478,263
Hose	577,389	199,427	5,016,909	1,686,884
Packing	187,060	72,639	1,240,528	543,168
Thread	101,921	102,614	991,827	970,113
Other rubber manufactures	.....	200,984	.....	1,626,829
Totals	.....	$4,328,031	.....	$36,079,723

‡ Liquid latex included.
*Beginning June 18, 1930. †Ending June 17, 1930.

United Kingdom Statistics

Imports

	August, 1930		Eight Months Ended August, 1930	
UNMANUFACTURED				
Crude Rubber From—	Pounds	Value	Pounds	Value
Strait Settlements	9,926,000	£229,482	115,898,100	£3,533,981
Federated Malay States	4,617,100	106,952	49,855,200	1,528,994
British India	899,200	22,145	10,343,000	315,321
Ceylon and Dependencies	3,441,300	75,710	23,105,100	682,274
Java and Dutch Borneo	2,532,100	64,016	22,733,800	695,507
Sumatra and other Dutch possessions in Indian Seas	965,900	27,615	14,821,600	473,874
Other countries in East Indies and Pacific not elsewhere specified	229,400	4,885	2,238,400	68,786
Brazil	319,200	8,852	3,738,900	118,677
South and Central America (except Brazil)	.....	.....	122,200	3,719
West Africa				
French West and Equatorial Africa	.....	.....	278,600	7,883
Gold Coast	21,700	466	274,000	8,064
Other parts of West Africa	189,300	3,887	1,207,000	36,989
East Africa, including Madagascar	59,900	1,340	451,600	13,719
Other countries	24,800	897	1,751,100	57,839
Totals	23,225,900	£546,247	246,818,600	£7,545,627
Gutta percha and balata	184,700	14,035	2,989,000	222,786
Waste and reclaimed rubber	1,039,000	11,478	6,232,600	75,888
Rubber substitutes	15,300	309	118,200	2,430
Totals	24,464,900	£572,069	256,158,400	£7,846,731
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£27,118	.....	£243,175
Inner tubes	.....	3,514	.....	48,351
Solid tires	.....	3,192	.....	31,627
Boots and shoes—*doz. pairs*	48,377	102,727	1,020,243	1,131,404
Other rubber manufactures	.....	137,954	.....	1,545,807
Totals	.....	£274,505	.....	£3,000,364

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,416,300	£12,436	14,682,700	£119,546
Rubber substitutes	39,100	769	347,000	7,390
Totals	1,455,400	£13,205	15,029,700	£126,936
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£303,803	.....	£2,834,444
Inner tubes	.....	52,182	.....	422,537
Solid tires	.....	5,363	.....	59,511
Boots and shoes—*doz. pairs*	20,073	30,945	179,668	248,647
Other rubber manufactures	.....	175,657	.....	1,732,539
Totals	.....	£567,950	.....	£5,297,678

Exports—Colonial and Foreign

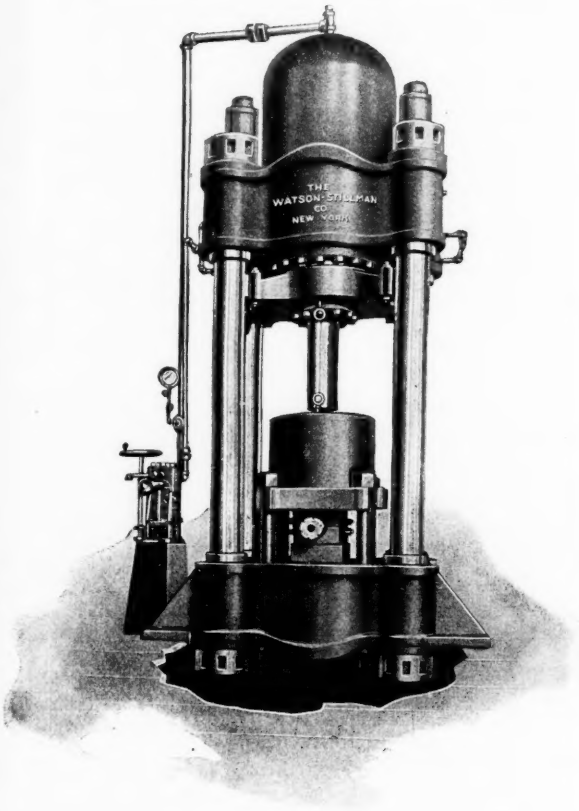
UNMANUFACTURED				
Crude rubber To—				
Russia	68,600	£2,373	8,118,800	£307,425
Sweden, Norway, and Denmark	445,300	11,282	1,527,700	58,587
Germany	1,369,800	36,471	19,327,500	624,391
Belgium	595,500	17,514	5,471,100	188,466
France	941,100	26,995	15,797,200	562,433
Spain	102,900	4,039	609,000	27,555
Italy	118,000	2,980	2,701,000	90,347
Other countries in Europe	507,100	17,049	3,035,700	123,186
United States	163,600	4,369	3,347,900	97,557
Other countries	167,300	3,664	1,055,500	44,510
Totals	4,479,200	£126,736	60,991,400	£2,124,457
Gutta percha and balata	23,300	1,504	428,300	36,232
Waste and reclaimed rubber	8,600	174	58,800	1,236
Rubber substitutes	1,400	30	2,900	60
Totals	4,512,500	£128,444	61,481,400	£2,161,985
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£13,320	.....	£51,402
Inner tubes	.....	1,073	.....	5,684
Solid tires	.....	16	.....	190
Boots and shoes—*doz. pairs*	1,297	2,646	17,231	30,184
Other rubber manufactures	.....	5,563	.....	50,961
Totals	.....	£22,618	.....	£138,421

* Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and tires and tubes until Apr. 11, 1927, inclusive.

Balata Exports Show Much Gain

Despite the depressed condition of the balata market, exports from British Guiana for the first five months of 1930 show a gain of 30 per cent over the same period in 1929. Total exports in 1929 were 599,897 pounds value, $231,651, as compared with 647,567 pounds worth $257,448 in 1928. Dutch Guiana in 1929 produced 446 metric tons of balata, as compared with 511 tons in 1928 and 770 tons in 1927.

WATSON-STILLMAN LEAD PRESSES



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Official Rubber Goods Production Statistics

Tires and Tubes	1930 June	1930 July	1930 August	1929 June	1929 July	1929 August	1928 June	1928 July	1928 August	Cumulative Total from January 1 through August 31: 1930	1929	1928
Pneumatic tires:												
Production ...thousands	4,098	3,193	3,332	5,478	4,856	4,354	5,030	4,881	5,607	30,840	42,575	39,183
Stocks, end of month...thousands	10,622	9,449	8,678	13,468	11,872	10,669	9,150	8,396	7,539	.....	.....	.....
Shipments—												
Domestic ...thousands	4,050	4,229	3,976	5,288	5,723	5,667	5,162	5,811	6,131	30,186	40,380	37,754
Export ...thousands	185	129	164	153	168	217	184	121	179	1,447	1,658	1,212
Inner Tubes:												
Production ...thousands	3,960	3,151	3,837	5,234	4,634	4,385	5,222	5,009	6,264	31,129	41,289	41,565
Stocks, end of month...thousands	10,889	9,326	8,589	14,056	12,249	10,613	12,892	11,248	10,466	.....	.....	.....
Shipments—												
Domestic ...thousands	4,082	4,594	3,492	5,115	5,993	6,028	5,254	6,469	6,886	30,681	41,477	40,107
Export ...thousands	131	90	118	98	91	109	105	83	132	899	1,051	875
Solid and Cushion:												
Production ...thousands	17	13	16	40	39	32	49	46	52	146	288	356
Stocks, end of month...thousands	107	101	90	133	129	118	156	152	149	.....	.....	.....
Shipments—												
Domestic ...thousands	18	19	22	38	39	40	45	45	49	166	296	331
Export ...thousands	2	1	1	3	2	3	5	4	5	13	20	32
Other Rubber Products												
Rubber-proofed fabrics, production:												
Total ...thous. of yds.	3,379	2,940	3,458	4,409	4,260	5,085	2,953	3,447	4,613	27,695	32,422	24,068
Auto fabrics ...thous. of yds.	851	608	678	1,199	1,188	1,349	895	763	764	7,322	7,947	6,434
All other ...thous. of yds.	1,042	917	975	1,262	1,208	1,317	707	733	1,251	11,975	10,131	6,621
Raincoat fabrics ...thous. of yds.	1,486	1,415	1,805	1,948	1,864	2,419	1,351	1,951	2,598	8,398	14,344	11,013
Rubber heels:												
Production ...thous. of pairs	15,795	15,117	13,235	20,007	19,315	23,095	18,763	17,620	21,289	122,593	155,394	157,290
Shipments—												
To shoe manufacturers...thous. of pairs	10,287	11,668	8,813	12,262	13,785	14,942	9,166	12,070	11,642	75,685	96,430	82,085
To repair trade...thous. of pairs	5,186	5,053	6,622	8,256	6,337	8,025	9,022	7,372	9,244	45,439	58,199	61,845
For export ...thous. of pairs	829	938	780	926	794	1,098	964	457	729	7,455	8,654	6,842
Stocks, end of month...thous. of pairs	38,852	36,220	33,226	44,581	44,243	43,960	50,569	49,679	49,511	.....	.....	.....
Rubber soles:												
Production ...thous. of pairs	2,734	2,663	1,473	2,502	1,295	2,948	3,321	3,168	3,641	19,818	21,753	27,203
Shipments—												
To shoe manufacturers...thous. of pairs	2,549	2,627	1,161	2,185	1,372	2,548	1,977	1,897	2,209	17,088	17,446	15,484
To repair trade ...thous. of pairs	309	364	317	522	163	517	948	808	917	2,992	4,781	7,449
For export ...thous. of pairs	31	34	74	17	70	78	41	55	46	442	434	1,889
Stocks, end of month...thous. of pairs	3,307	2,876	2,289	3,843	2,895	3,319	4,687	5,067	5,633	.....	.....	.....
Mechanical rubber goods:												
Shipments—												
Total ...thous. of dolls.	5,318	4,910	4,452	6,792	6,306	6,792	6,126	5,157	6,306	43,458	53,294	47,402
Belting ...thous. of dolls.	1,238	1,364	1,248	1,613	1,645	1,940	1,568	1,396	1,888	10,279	12,928	11,678
Hose ...thous. of dolls.	2,199	1,856	1,682	2,658	2,355	2,196	2,298	1,795	2,068	17,757	19,964	18,041
All other ...thous. of dolls.	1,881	1,690	1,622	2,521	2,305	2,656	2,260	1,966	2,360	15,420	20,403	17,702
Rubber bands, shipments ...thous. of lbs.	177	174	164	187	192	196	192	173	193	1,627	1,758	1,533
Rubber flooring, shipments...thous. of sq. ft.	634	507	559	525	566	598	717	477	583	4,367	4,471	4,506
Calendered rubber clothing:												
Production ...no. coats and sundries	55,411	38,582	44,952	87,530	89,871	96,281	109,802	59,685	74,509	501,876	651,276	819,751
Net orders ...no. coats and sundries	21,249	28,767	26,348	98,444	60,921	37,906	89,145	37,512	64,695	445,564	473,423	525,300

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Tire Production Statistics

	High Pressure Pneumatic Casings: All Types In-ventory	All Types Produc-tion	All Types Total Shipments	Cord In-ventory	Cord Produc-tion	Cord Total Shipments
1928	10,217,708	58,457,873	55,721,937	3,580,576	19,302,218	19,351,380
1929	9,470,368	54,980,672	55,515,884	2,290,236	13,765,025	15,016,460
1930						
January	9,539,353	3,588,862	3,525,404	2,382,959	804,783	713,713
February	9,928,838	3,644,606	3,356,104	2,474,495	662,419	599,599
March	10,010,173	3,890,981	3,773,865	2,458,117	572,417	588,613
April	10,461,208	4,518,034	4,071,822	2,493,603	656,281	610,308
May	10,745,389	4,573,895	4,173,177	2,421,953	618,012	677,999
June	10,621,634	4,097,808	4,234,994	2,258,517	584,089	748,203
July	9,449,318	3,193,057	4,357,836	1,835,760	425,844	845,072
August	8,678,164	3,332,489	4,139,900	1,516,904	506,305	869,662

	Balloon Casings In-ventory	Balloon Casings Produc-tion	Balloon Casings Total Shipments	Solid and Cushion Tires In-ventory	Solid and Cushion Tires Produc-tion	Solid and Cushion Tires Total Shipments
1928	6,594,978	38,878,218	35,931,982	152,120	508,223	512,602
1929	7,160,127	41,128,577	40,377,781	122,200	409,344	427,779
1930						
January	7,139,154	2,779,864	2,805,740	126,784	25,049	21,476
February	7,436,247	2,975,922	2,750,324	127,793	22,302	21,005
March	7,535,468	3,311,978	3,177,634	123,179	19,329	23,951
April	7,951,317	3,854,540	3,454,171	116,595	17,335	24,232
May	8,323,436	3,955,883	3,495,178	108,055	16,752	24,426
June	8,363,087	3,513,719	3,486,791	106,589	16,612	19,613
July	7,613,558	2,767,213	3,512,764	100,930	12,893	20,545
August	7,161,260	2,796,184	3,270,238	90,245	16,064	23,519

	High Pressure Inner Tubes In-ventory	High Pressure Inner Tubes Produc-tion	High Pressure Inner Tubes Total Shipments	Balloon Inner Tubes In-ventory	Balloon Inner Tubes Produc-tion	Balloon Inner Tubes Total Shipments
1928	5,037,716	23,255,891	23,749,966	7,049,748	36,878,990	34,095,223
1929	3,339,451	16,100,281	17,718,806	6,889,213	38,921,749	38,719,177
1930						
January	3,233,813	783,709	889,208	6,911,422	2,898,682	2,992,752
February	3,243,130	675,126	680,989	7,171,395	3,030,745	2,786,578
March	3,137,472	619,416	696,161	7,392,794	3,331,739	3,082,456
April	3,144,558	678,152	674,032	7,871,181	3,728,177	3,202,261
May	2,983,388	683,236	769,463	8,098,115	3,745,131	3,289,384
June	2,781,524	641,508	914,909	8,107,920	3,318,464	3,297,573
July	2,098,130	634,751	1,252,806	7,227,472	2,516,356	3,431,376
August	1,853,988	1,084,265	1,335,284	6,735,316	2,752,615	3,274,572

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1928	222,243,398	600,423,401	13,633,452,000
1929	208,824,653	583,039,984	14,748,552,000
1930			
January	14,559,163	42,108,149	1,080,660,000
February	13,766,977	40,378,929	1,060,640,000
March	14,655,987	43,910,926	1,241,240,000
April	17,263,963	51,151,863	1,382,400,000
May	17,436,928	52,130,471	1,459,880,000
June	15,034,336	45,705,967	1,508,220,000
July	13,399,389	39,365,247	1,533,880,000
August	13,222,934	40,735,541	1,497,920,000

Rubber Manufacturers Association figures representing 75 per cent of the industry.

Sponge Rubber Quiets Cars

Sponge rubber mats wholly covering the entire floors of inclosed automobiles are said by British experimenters to effect a remarkable difference in driving and passenger comfort over that derived from carpet or solid rubber matting. Engine and rear axle noise are said to be especially quieted.

British Indian Exports

Total exports of rubber from India in August amounted to 600 long tons. The total for June, July, and August, 1930, was 2,170 tons against a corresponding figure of 2,783 tons for the 1929 period, indicating a decline in production in this relatively unimportant producing area.